COAL AGE

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THE pervading influence of Christmas time is with us. The very atmosphere is charged with joyous preparations for yuletide festivities. Is the spirit upon you, or have you reached a point where you live outside the circle of things humane?

Life is not all sunshine and laughter. We can't harvest without we till and sow. But the man who can pound his way through the month of December and into the New Year, without having his heart warmed by a single generous desire to create happiness in the lives of others, had better awake to the necessity of securing an immediate remedy for a degree of personal selfishness, which left unchecked will stifle every decent human impulse.

If we have become so ultra-modern, so machine-like that sentiment and sympathy have vanished, and if the laughter and prattle of expectant children provoke rather than please us, then we should hearken back in memory to the time when our own "kiddies" were small. How we did enjoy Christmas day! And what a lot of fun we had planning weeks ahead to please and surprise the youngsters whose imaginations fairly ached with the possibilities of the coming of "Santa."

Of course, the fun was all intended for them; but, when we look back, doesn't it seem as though we had more than our share of the enjoyment? Therefore, if making children happy made us happy, and if Saint Nick were in truth more of a reality than a myth, why shouldn't Christmas still be Christmas to us?

You say, "the children are all————————" Wait a moment. Wonder how Tim Jones' widow and his seven "kids" are going to pull through this winter? When Tim disobeyed the foreman's instructions and insisted on driving ahead, in spite of the treacherous draw-slate, he probably deserved just what he got—but what about his "kids?" Yes, we made up a purse of $200 to give the widow, and the company buried Tim—let's see, that was 9 months ago. His boy Jim is earning $1 a day now, trapping—seven mouths to feed, and only $1 a day coming in. What about their Christmas?

And have you noticed one-armed McCrorie lately? Looks pretty blue. Yes, he's still picking slate and earning about $1.75 per day, but you see when that no-account son of his got drunk and shot his wife and killed himself, the old man inherited the children (six of them), and the children and the old man are keeping things going the best they can. The oldest girl is 12, and they say she is some housekeeper. What about their Christmas?

Did you hear about Sam Ivester's trip to town last Christmas Eve? They say he carried $25 with him to buy presents for all the neighborhood—no one heard from him again until after New Years. No, he didn't steal the money; he simply got drunk and landed in jail. Nearly every Christmas eve a lot of our miners do that very trick. Why, it's such a common occurrence that no one gives it a second thought.

No one?—Somewhere in a tumbled down rickety bed there is a little girl sleeping, and if you could peep in at the window, you would see a smile on her lips. Tomorrow is Christmas, and tomorrow—Oh! wonders of wonders! she, a six-year old, has been promised a doll with real hair and eyes that can go to sleep. Now, mind you, she knows that Santa couldn't be tempted to bring such a wonderful present to just any poor little miner's daughter, and so to be sure that he won't disappoint her, she has taken such very good care of her little four-year old brother.

On the morrow when the father becomes sober and realizes how he has betrayed his trust, do you think he will be able to do aught toward restoring happiness to the little daughter who prayed to Santa Claus, but prayed in vain.

Men of the mines: You are known the world over as big-hearted and generous, but you are sometimes careless and not always considerate. Be ye thoughtful today! Think of the children whose faith in Santa Claus will be shattered this Christmas unless *You* come to the rescue.

To promise earthly reward for good deeds is not becoming in man. However, here's a recipe for happiness: On Christmas morn mingle with the "kids" whose Santa Claus started from your house the night before, and when you return home, Saint Nick and the spirit of Christmas will return with you.

Ideas and Suggestions

Interesting Talks Submitted in Response to Our Recent Request for Forewords.

Some Difficulties Often Overlooked

BY AN ALABAMA ENGINEER

The average city boy, just arrived at the age of erudition, defines electricity as something which Ben Franklin brought down from the clouds, while a boy raised around mining camps regards it as something which takes men up into the clouds, if they give it half a chance. The more you ponder this last definition, the more you will become convinced that it covers the ground pretty thoroughly.

Mining men interested in electricity can be separated into two distinct classes: First: Those who are about to use it. Second: Those who have already installed it.

The eligible to the first class are the more interesting. If the opportunity present itself we suggest that you observe the line of talk they hand out when questioned as to just what they hope to accomplish by their proposed electric installation; and then recall if you please that the miners' boy said "that electricity takes men up into the clouds."

Unfortunately, the man who is installing his first electric plant is not permitted to remain in the clouds for long; in fact, some have even been known to continue their travels downward (figuratively speaking, of course) when they started to descend, until they almost reached the place where all bad boys belong.

If you assume from the above that we are trying to throw cold water on electricity—guess again. The fellow who does that may land in the clouds and remain there indefinitely.

What we are leading up to is just this: It takes more than imagination to install a successful electric plant.

Why?

Well, principally because the mistakes made in an electric plant are not easily remedied, and it is difficult to evolve a successful operation by changing first this thing and then that. The time to "monkey" with electricity is before the current is on; once on, it refuses to be led, very much as does a balky horse; the more you fool with it the madder you get and you don't get anywhere at that.

If the word "monkey" as used above does not suggest to you a definite image for some fellows' movements it is more than probable that you've never lived neighbor to a mine newly equipped with electricity. If such is the case, and you hope soon to let the electric bee buzz in your bonnet, better plan a trip and be educated.

In the meantime assume that the following statements are approximately correct:

An operator who installs electric haulage in a mine and attempts to run the locomotives on light rail intended for mule trips will "monkey" with ties, rails and switches until all of the old equipment is replaced.

The electrician who carries "juice" into his mine on so called insulated wire, leaving it exposed on manways, will "monkey" with this wire (possibly this action will be postponed until someone receives a shock) until it is all out of sight.

The master mechanic who locates motor-driven pumps in low places in his mine without considering the possible high-water line in case the pump should balk for a few hours during the rainy season, will probably "monkey" with flooded mines and ruined motors.

The superintendent who couples twenty or thirty cars in motor trips without realizing that drawbars and couplings which serve perfectly for two-car trips are not suitable for all purposes will "monkey" with broken couplings and drawbars and run away trips until they are all replaced.

The mining engineer who doesn't realize how shallow swags that only hold enough water to wet the mine-car axles (they were never noticed in the days of mule haulage) are capable of destroying most any motor, will "monkey" with field coils and armatures the while he cusses the insulation.

The mine foreman who doesn't realize that it takes more side tracks and more standing cars to operate motor haulage than were required when mules were in vogue, will "monkey" with his motormen until in desperation they will exceed the speed limit.

The Labor Problem

By George McGee*

There is a dearth of skilled and unskilled labor in many anthracite mining districts today. The old school of trained practical miners are fast disappearing from the stage. Age, accidents, and disease, have decimated their ranks. Who will take their places at the mines?

Certainly not their sons. The second generation of miners is fast gravitating into other avenues of employment, where life is more congenial and the risks encountered much less. Few indeed are the young men employed in the anthracite mines today who have passed the eighth grade in our public schools. The flow of immigration from Russia and Southern Europe is being diverted into other channels. Naturally agriculturists, the Slav and the Pole are attracted to the wheat fields of the West where the prospects of getting a home and providing for old age are much brighter than in the mines.

Pennsylvania's compulsory education law is a positive factor in regulating the law of supply and demand as it applies to mine labor. Sixteen years is the minimum working age in the mines—fourteen years on the breakers—provided the boy

*Freeland, Penn.

applying for work can read, write and understand the English language.

This law is rapidly transforming the anthracite industrial system. When it comes to facing the daily dangers to which his father grew accustomed, the product of our American public school balks. A knowledge of elementary physical laws has produced a keener consciousness and conception of danger. He lacks the dash and bravery that distinguished his illiterate father in the performance of dangerous work in the mine. Education has raised him to a higher plane. He realizes that while he is fairly well paid for actual labor performed in the mines, he receives but little for the dangers encountered. He wants higher wages and more congenial surroundings.

We are approaching the crossroads; it is now a question of direction. Shall the standard of wages and conditions of employment be raised to a plane that will induce American young men to become practical miners, or shall we lower the anti-immigration barriers, and the standard of American civilization, by importing Kaffirs from Africa or Coolies from Asia?

The problem has economic, sociological, and psychological aspects that appeal to the people as a whole, but in a particular manner to mine owners, managers, and mine-workers. The public is demanding the conservation of our natural resources. When applied to coal mining, conservation means a higher standard of service in the management of mines and in the personnel of the employees. If the last pound of coal is to be won from the mine, it means increased danger to those engaged in the work, and higher pay for the workers is the logical sequence.

Viewed from any angle, the future cost of producing anthracite coal tends upward. Taking the scarcity of labor and the increased cost of living into consideration, any attempt to recoup the owners by scaling down wages and rates seems foolish and impracticable; yet some mine managers keep plodding along in the old rut, unconscious of the revolutionary forces operating around them.

When Cars Are Scarce

By Josiah Keely*

The scarcity of loaders has been such a serious obstacle to maximum output that not a few inventive minds have been active in devising some machine to replace them. As yet nothing has been produced promising relief and it is therefore necessary to study the best methods for obtaining the maximum efficiency under present conditions.

When we correlate this class of labor with the ordinary pick-and-shovel man we are far from accurate in our classification. The operator who thinks he can gather up a party of average day laborers and make loaders out of them will find a longer apprenticeship necessary than might be supposed.

The superintendent is frequently asked by the management: "How many loaders could you place?" As scarcity of loaders has been given as reason for the small output, the superintendent replies confidently: "Fifty, right now." But should this number appear on the spot, it would probably be to the utter confusion of this "cock-sure" individual. Perhaps there are even more than fifty places to be worked, but how many of them actually have cars in, water pumped out, timbered, ditched, slate cleaned up, track in good condition, cut, and shot?

The shooting of the coal might of course be postponed, pending the determination of the experience of the loader, but a place is not actually ready until all these things are done and an empty car placed beside the loose coal.

The new applicant is likely to be a wandering laborer who has heard that loading coal is a quick way of getting rich at a minimum expenditure of energy. He may "stick", however, if he finds that he can do a little better than on other kinds of work, and there is no doubt that he can if given the proper chance.

The new man's training for efficient work is becoming urgent. There is a trick in shoveling coal, and is it not the province of those in authority to see that the new loader is properly taught? If he is strong and willing, but uses his shovel only righthanded, does most of the work with his arms, makes several motions where one would suffice, is it not worth while for someone to show him? Money and brains are being employed to show the football player just how to make every pound of his weight and strength count, and I believe the new loader will stand a little coaching.

The old miners tell us that in the former times two men had to work in one place, but they were better satisfied than the present miner who occasionally has two places. In West Virginia there are just about half enough men to fill up our working places. While such conditions exist, why not give each loader two places? It is an advantage to the machine runner, since it keeps him further ahead and if he is cutting for one-place loaders, two or three may "square-up" at the same time, there may be delay in getting the machine moved, or he may have to set bits or go to the shop.

It is also a distinct advantage to the driver since he does not have to shift cars at the room mouth, but takes an empty into one room, goes through a crosscut and hauls the load from the next place.

Your coal loader likes to start in early in the morning and load in a sweat until he has what he considers enough. The faster you can get cars to him when the frenzy is on, the greater will be your day's output at the mine, for not many of them will stay in to get their last car when they could have been finished earlier in the day. Any little delay that stops the sweat will be sufficient excuse for him to quit—in order to get a good start for the next day.

In soliciting loaders, we usually have it set down in our "prospectus" that we can give them "all the cars they can load." This ideal is never quite reached but, when loaders are scarce, it gives an opportunity to see just what may be done toward maximum efficiency, expressed in tons per man.

Some mines take on new loaders even when the places are filled, and thus always have a man ready to take the place of one who has stayed out. This may be one way of getting tonnage, but you will note on the tipple sheets that the number of cars per man is low, and, since few of us will ever be confronted with an over supply of loaders, it seems more scientific to keep before us the real goal of tons per man.

We get our full quota of complaints from the loader without hunting for them, but much valuable information can be obtained by making systematic inquiry of the light loaders. I will not say that such information is always exact, and it is certainly not good practice to take it to those in charge of the inside work when it reflects on their management, but the fact that these inquiries are being made has a tendency to encourage truthful statements from the loaders of their difficulties and an effort on the part of all to obviate needless delays.

I hope it may not be set down as sermonizing to add that these inquiries are only helpful in proportion to the common sense manner in which they are conducted.

*Superintendent, Consolidation Coal Co., Shinnston, W. Va.

Colliery Practice in Concreting

By Elwyn E. Seelye* and A. T. Shurick

The first of a series of articles on the application of concrete to coal mining. The present installment deals principally with the character of the ingredients, tests for same and the approved methods of mixing. The different forms of reinforcement commonly used, and the theory of design treated in an elementary way, will follow in early issue.

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The introduction of concrete as a structural material was one of the most important steps toward economical construction, but care must be exercised in its use. The wooden beam is formed by nature and cut to fit, by man. The steel beam is rolled from a steel billet which has been produced in a gigantic laboratory—the steel mill. Its strength is known with a fairly close degree of precision because its chemical composition and crystalline state are known to the metallurgist.

But what can be said of the reliability of a structural member of reinforced concrete which is manufactured at the mine, by unskilled laborers, presided over by an indifferent foreman, and whose strength is dependent upon chemical reaction and physical relation? For this reason it is pertinent to outline correct methods of construction and rules for guarding against an imperfect product.

Cement

To attain the chemical reaction we must procure an unstable compound known as Portland cement. This compound must be transported to the mine in an absolutely dry state and must be so maintained until the water is added in the mixing process.

Test Samples—For assurance that the cement possesses the desired properties on being mixed with water, samples should be taken and tested. After arrival on the site a handful should be taken from every tenth bag and mixed together to form a test sample for each carload lot. This sample should be sent to a reliable cement laboratory to be tested. The following are approximately the minimum requirements laid down by the American Society of Civil Engineers and are the ones generally followed in the cement testing laboratories.

Tests Essential for Good Cement—A briquette of neat cement should show a tensile strength of 175 lb. per sq. in. after 24 hr. time of setting, 500 lb. after 7 days and 600 lb. after 28 days. There should be an increase of strength between the 7- and 28-day test. Briquettes of one part cement and three parts sand should show a tensile strength of 200 lb. per sq.in. after 7 days and 255 lb. after 28 days, with an increase during the period between the 7 and 28-day tests. The time for the initial set to take place should not be less than 30 min. and the final set should occur at the end of 10 hours.

In the boiling test, pats of neat cement on glass slides are allowed to set 24 hr., then exposed in steam for three hours and in boiling water the same time. After this they should show no cracks, warping or swelling. For the fineness test 92 per cent. should pass a 100-mesh sieve and 75 per cent. a 200-mesh sieve. The boiling and sizeing tests are the ones on which most cement generally fail.

The Aggregate

Sand—The following points should be closely observed in choosing materials for the aggregate. The sand must be clean and sharp with not more than 10 per

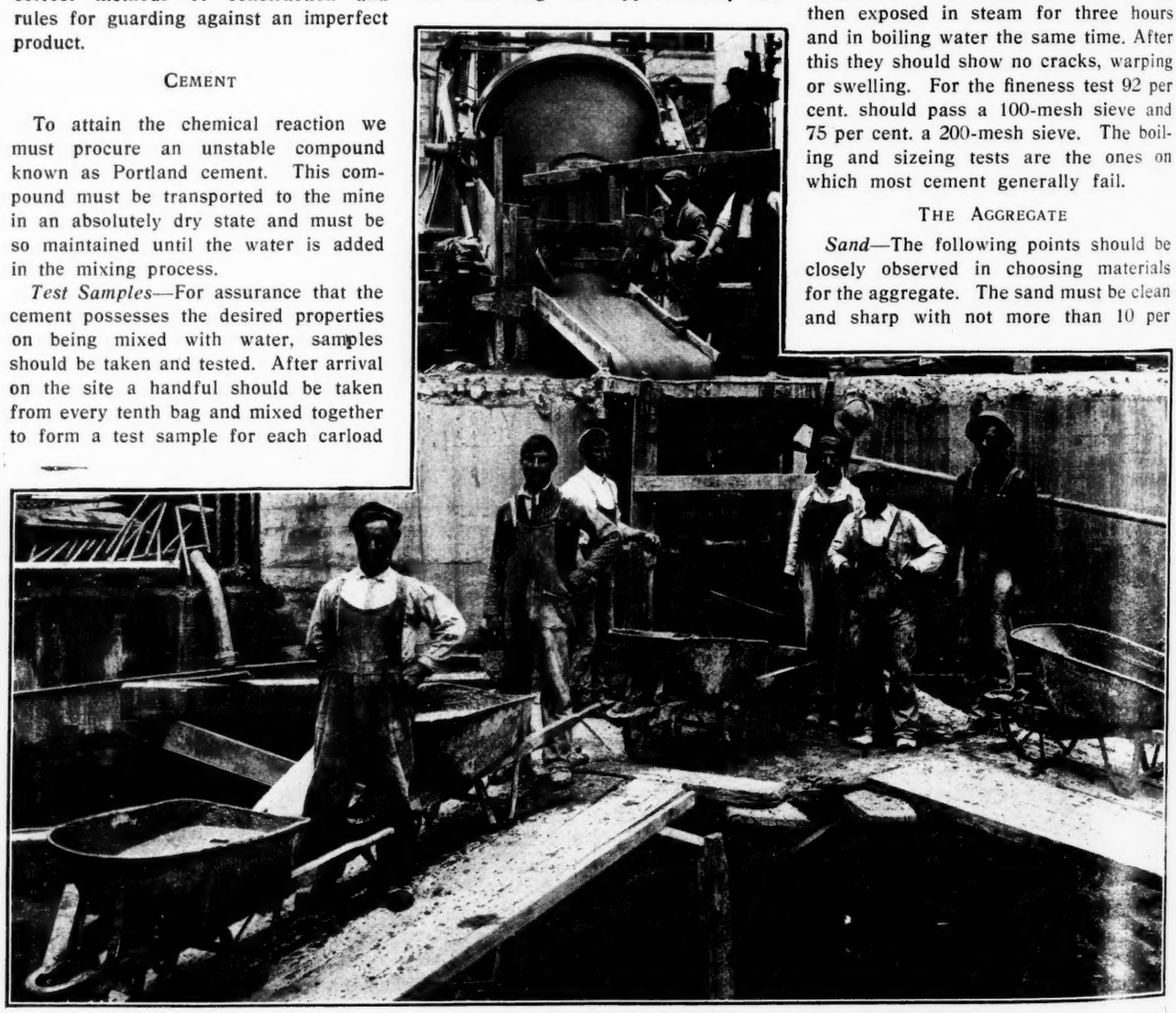

Fig. 1. General View of a Concreting Operation Showing Smith Mixer Dumping

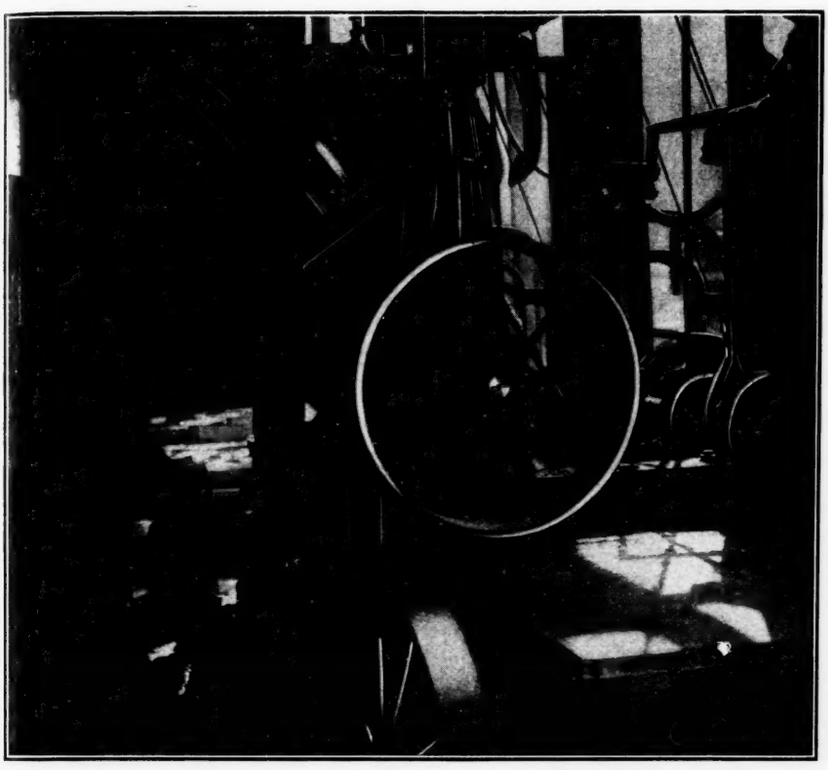

FIG. 2. NEAR VIEW OF A SMITH MIXING MACHINE

cent. loam, and not more than 25 per cent. should pass a 40-mesh sieve.

The quantity of loam in sand may be determined in a practical way by filling a bottle half full of sand, adding water, shaking thoroughly and allowing the bottle to stand until the water above the sand has cleared. The loam will be found deposited in a layer on top of the sand and its percentage may be determined by scaling the depth of each. A large percentage of pyrites, mica, or organic matter should be cause for the rejection of a sand. Quartz sand is generally considered the best.

A point of peculiar interest to coal miners is mentioned in Reid's "Concrete and Reinforced Concrete Construction." He quotes to show that sand containing not more than 25 per cent. of fine anthracite coal is suitable for reinforced concrete.

The Coarse Aggregate — Broken stone, gravel, cinders and slag are the commonest materials used for the body of the aggregate.

Crushed limestone, granite, trap, or other hard rocks are satisfactory.

Gravel should be composed of smooth, round pebbles running up from the size of a pea. A gravel or stone of varying size will be preferred as the small sizes will fit into the voids of the larger, forming a denser aggregate. Gravel or stone should be free from loam.

Cinder concrete is adaptable to use where neither the tensile nor compressive stresses run very high. The cinders should be steam washed and free from ash.

Crushed blast-furnace slag may be used with caution. It generally has a high coefficient of absorption and should be thoroughly wet before using to prevent the absorption of the water required in the chemical reaction.

Forms—Forms should be made tight to prevent leakage of the finer portions of the mixture. Where holes between the rock and the planks occur they should be sealed with cement mortar before pouring. The forms should be built solidly and of sufficient strength to resist hydraulic pressure of a head equal to the height of concrete to be poured in one operation. This question will be taken up in detail in subsequent articles, dealing with typical structures. Reinforcement should be rigidly secured so as not to be disturbed during the operation of pouring and tamping.

PROPORTIONING CONCRETE

When satisfactory materials are at hand, and forms completed with reinforcement in place, the operation of mixing may be started.

Proportions for the Aggregate—A system of measuring should be devised sufficiently simple that it may be carried on rapidly and without the liability of mistakes.

The ideal proportion is one in which the fine particles successively fill the voids between the next larger particles, thus forming a dense concrete. This class of work is very nearly waterproof. Tests may be made to ascertain the per cent. of voids existing in the sand and stone which will indicate the ideal proportions, but for ordinary purposes the ratios are shown in the accompanying table.

CONCRETE PROPORTIONS

	Cement	Sand	Aggregate
Footings	1	4	8
Retaining Walls	1	3	6
Reinforced Concrete	1	2	4
Cinder Cakers*	1	1	3*

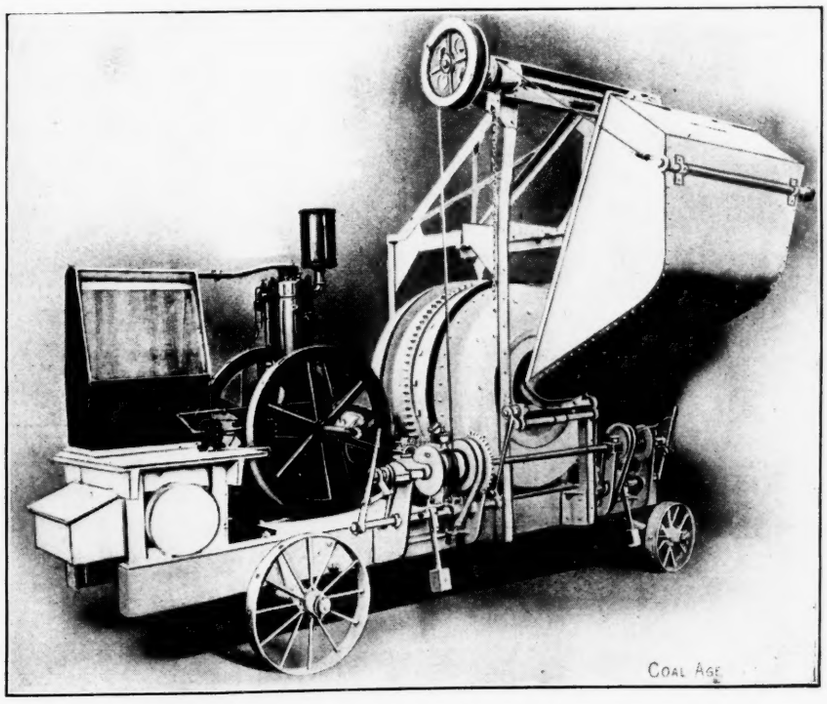

FIG. 3. RANSOME MIXER WITH COMPLETE EQUIPMENT

Sizes of the Aggregate—The sizes of the broken stone, slag or gravel should be limited as follows:

SIZES OF COARSE AGGREGATE

Class of work	Inches
Massive walls and footings	2
Ordinary walls and footings	1½
Reinforced concrete and thin walls	¼ to ½

In massive walls or footings cyclopean masonry may be used, that is, one-man stones or larger, with the interstices filled with concrete. A cross section of a wall of cyclopean masonry is shown in the accompanying drawing, Fig. 6.

Practical Systems of Measuring the Aggregate—In arranging a system of measuring it should be remembered that a bag of cement holds one cubic foot. Wheelbarrows may be bought which hold 4 cu.ft. and thus we get the proportion of 1:4:8 by using two bags of cement, one wheel barrow load of sand and two of stone. For hand-mixing a bottomless box should be built as shown in Fig. 7. This can be filled and emptied with great facility.

METHODS OF MIXING

The most common methods of mixing in use are, hand mixing, the rotary batch mixer, the continuous mixer, and the gravity mixer.

Hand mixing should be done on a plank platform about 10 ft. square. First the sand is spread out evenly in a layer about 6 in. thick. On this is spread as evenly as possible, the cement as shown in the accompanying Fig. 8.

The whole is turned over at least twice with a shovel and placed in a pile at one side. The broken stone is then spread out and the already mixed sand and cement laid on top of it. Into this water is worked from one side until the whole is intimately mixed and of uniform appearance.

FIG. 5. VIEW OF A CONTINUOUS MIXER IN OPERATION

FIG. 4. VIEW SHOWING THE RANSOME MIXER WHEN CHARGING

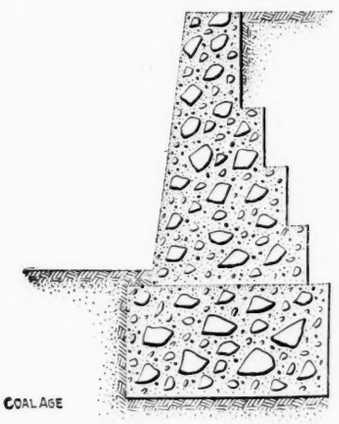

FIG. 6. CYCLOPEAN MASONRY

The rotary batch mixer generally consists of an iron box of cubical or cylindrical shape which revolves on its axis. The materials are introduced through an opening near the centre on one side and the concrete is drawn off through a chute near the centre on the other. In the accompanying halftones are shown two mixers of this type. Figs. 1, 2, 3 & 4.

The continuous mixers consist of a trough in which revolves a helical screw or propellers. The ingredients enter the

trough at different points, in measured quantities and at accurately-timed intervals, so that when emitted from the trough they are intimately mixed. A mixer of this type is also illustrated. Fig. 5.

The gravity mixer consists of a series of hoppers placed one below the other. The ingredients are dumped into the top hopper and mixed, during the descent.

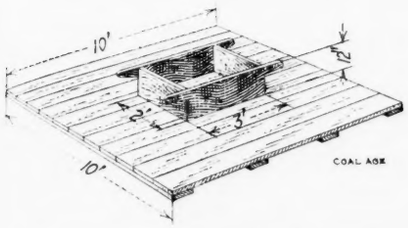

FIG. 7. PLATFORM FOR HAND MIXING

FIG. 8. METHOD OF LAYING OUT MIXTURE

The batch mixer is the one in most common use for reinforced concrete, the continuous type being used more frequently on pavement work. The gravity mixer has not come into general use, its application being confined mostly to heavy masonry.

The principal criterion of the efficacy of the mixing process is the appearance of the mixture. The amount of water used should be such that on a slight jarring of the concrete, as when it is placed in buckets for transportation it will assume a fluid state.

Special Ventilation by Air Pipes

By F. C. Cornet*

In the operation of a mine it is often found necessary to drive headings or other places, under conditions that make an air-course impracticable or, at least, inadvisable. To ventilate such places recourse is generally had to a canvas or wooden brattice. This is erected in such a manner as to divide the heading or room into two separate compartments, one of which is made the intake and the other the return for the air current ventilating the place.

A brattice of this kind often becomes expensive and bothersome, especially when the air must be carried any considerable distance, say 500 or 1000 ft. The trouble is aggravated when the coal liberates gas, because the brattice must then be built more carefully. Moreover, the end of the brattice near the face of the heading is often destroyed or badly broken by blasting.

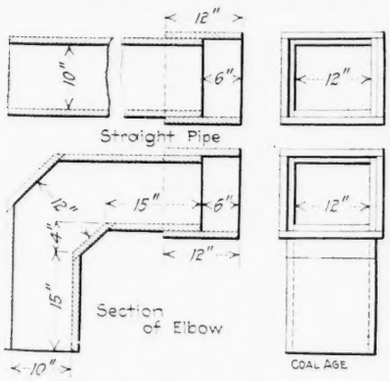

FIG. 1. CROSS-SECTION OF AIR PIPE, SHOWING ELBOW AND JOINT

In order to avoid the annoyance due to bratticing, the ventilation of a single heading or working place driven ahead of the air may be accomplished by conveying the air to the face through a large pipe; or a square wooden box is used, which the miners also call a "pipe." A cross-section of such a box is shown in Fig. 1. The box is 10x12 in., made in any convenient length and arranged so that the end of one section will slip over the end of a previous section; or a muff 12 or 18 in. in length is made to cover the joint between two sections. When necessary to introduce an elbow to change the direction of the pipe, this is made as shown in the lower part of Fig. 1.

In Fig. 2 are shown two methods of ventilating a single heading by a pipe. The first method shown, marked "the right way," is the one generally preferred and in use. In this method, the fresh air is conducted to the face of the heading through the pipe. In the second method, which, in the figure, is marked "the wrong way," the air flows through the heading to the face and returns through the pipe. In the first method, a regulator, or stopping, is built in the crosscut between the intake and return airway. The end of the pipe passes through this brattice or stopping to the other side. In the second case, the regulator, or stopping, is built in the return airway, just outside of the last crosscut, as illustrated in Fig. 2.

It is not usually necessary to convey the entire air current to the face of the heading; and, for this reason, the regulator is generally preferred to an air-tight stopping or brattice. As indicated by the arrows in the figure, a portion, only, of the intake air is conducted to the face of the heading, the remaining portion passing out by the return airway. By means of the door in the regulator, the air can be divided in any desired proportion, according to the requirements at the face of the heading. When the regulator is placed in the return airway, it forms an obstruction to the haulage of the coal, and it is then necessary to provide a door to allow the passage of the cars, unless these are hauled out by way of the intake.

It often happens that there are working places to be ventilated on the return airway, either inby or outby from the last crosscut; although it is not customary to turn places on the inside of the crosscut, unless the pipe will supply sufficient air for their ventilation. In order to ventilate the rooms outby from the crosscut, it may be necessary to adjust the regulator so that a larger volume of air will at once enter the return airway. This is done by enlarging the opening in the regulator, which, of course, reduces the water gage or pressure acting to pass the air through the pipe.

In actual practice, it has been found that less than one-half inch water gage, at the regulator, is all that is necessary to pass 450 cu.ft. of air per minute through a pipe 12 in. in diameter and 600 ft. long, allowing for one elbow near the regulator.

Pipe ventilation, of the kind described,

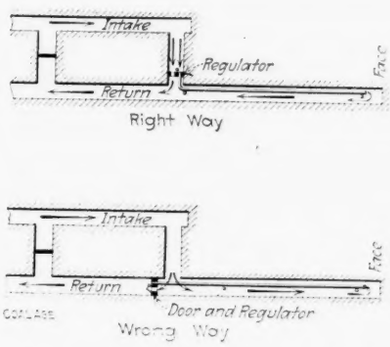

FIG. 2. SHOWING THE RIGHT AND WRONG WAYS OF CONNECTING AIR PIPE

is not as much used in this country as in the mines of France, Belgium and Germany, where the pipe system is often used to conduct the air long distances, the diameter of the pipe varying from 12 to 24 in. However, it must be understood that such pipe ventilation is used as a special or temporary arrangement only, and until the regular ventilating system can be established, when the pipes are removed and regular mining begins.

*Mining, civil and mechanical engineer, Charleston, W. Va.

Snap Shots in Coal Mining

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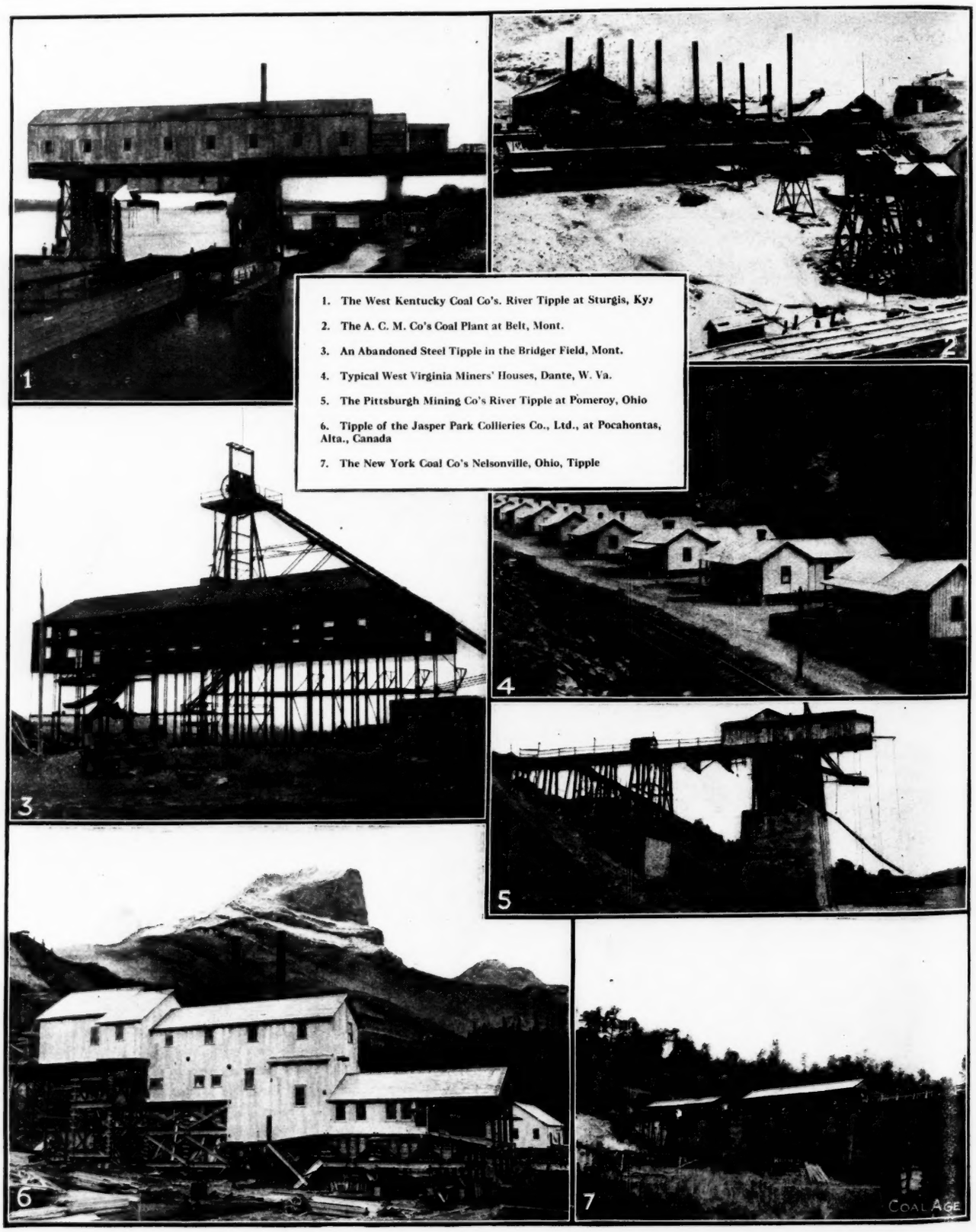

1. The West Kentucky Coal Co's. River Tipple at Sturgis, Ky.
2. The A. C. M. Co's Coal Plant at Belt, Mont.
3. An Abandoned Steel Tipple in the Bridger Field, Mont.
4. Typical West Virginia Miners' Houses, Dante, W. Va.
5. The Pittsburgh Mining Co's River Tipple at Pomeroy, Ohio
6. Tipple of the Jasper Park Collieries Co., Ltd., at Pocahontas, Alta., Canada
7. The New York Coal Co's Nelsonville, Ohio, Tipple

Purchased Power for Coal Mines

By G. P. Bartholomew*

The advantages accruing to coal operators from purchasing power from an independent company in contrast to manufacturing it themselves.

Various elements entering into the negotiations between producer and consumer and different types of contracts which are to be avoided are discussed.

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The power consumption of the average coal mine, while perhaps a matter of lesser moment in dollars and cents, in its relation to the cost of production, still is by far the most important element entering into the delivery of the product. It may be safely stated that the efficiency of the organization, the speed of operation, and the general spirit of the institution are in direct proportion to the power facilities.

While this phase of the industry has, unfortunately, in the past received scant consideration, the necessities of the case have of late, entirely reversed the situation; and without exception, the progressive operator is concentrating his energies toward securing a more efficient and adequate power supply.

The Advent of the Power Company

The unusual activity recently displayed in various coal centers by power companies seeking to enlarge their market and which are owned and controlled by interests wholly independent of the mines themselves, has put before the operator a possible solution of his difficulties that may eventually change the entire method of operation.

Whether or not this activity has been, in part, the result of a desire to control the situation, the fact remains that the power companies have at last awakened to the possibilities offered in these localities and many of the coal producers have likewise begun to realize the advantages to be gained by purchasing power rather than manufacturing it themselves.

The proposition presupposes that the power company can purchase fuel from the coal companies and sell to them in return, at a profit, a portion of the same energy in new clothing. This also assumes that the coal company cannot manufacture power as advantageously as can the power company.

There is more or less truth in both of these contentions, but as to the advisability of purchasing power from outside sources, much depends on the particular case under consideration. No hard and fast rule can be laid down covering all conditions.

Classes of Consumers

A possible consumer will generally come under one or more of the following heads:

First: An undeveloped property preparing to enter the producing stage.

Second: A developed property using no electrical equipment but finding it advisable to do so.

Third: A developed property electrically equipped with direct-current generating apparatus but which finds the equipment inadequate for future extensions due to the large amount of conductor capacity necessitated by the voltage adopted.

Fourth: A developed property using alternating-current equipment and substation distribution, but finding additional installations necessary to maintain or increase its production.

Fifth: A developed property using power in the form of air and steam, as well as electricity, and which decides on the electrification of all units.

While all cases, perhaps, will not be included in the above classes, the exceptions should be few. There are, however, certain general conditions which must be taken into account in the case of any rearrangement of the power scheme. The size and life of the property, present and expected daily tonnage, amount of cash available, value of released equipment and the relation of the operation to the neighboring field, all may have an important bearing on the argument.

Necessary Assumptions

We will assume that the mine operator is fully convinced of the necessity for improved power facilities and has under consideration the advisability of rearranging his present power plant, or purchasing power from an independent source.

The object of this article will be to show the possible advantages to be gained by the adoption of this latter alternative and the principal objections to be considered.

The question of greatest moment, naturally, is the cost of power to the purchaser. As to whether or not the rate offered by the power company is an attractive one, when compared with the figure at which the coal operation can manufacture its own power, is in most cases one difficult of determination.

Costs and Requirements Seldom Known

Few coal companies know what their power actually costs them. Likewise, few know their power requirements. Certain it is that the mine power plant is invariably overloaded, but just what amount of power will be required under proper distribution, is an unknown quantity.

Boilers of a definite rated horsepower, are no indication of a mine's consumption, seldom, indeed, are they even an evidence of capacity.

Elaborate systems of accounting and accurate methods of keeping track of all other costs entering into the production of coal, are religiously adhered to, but the cost of power, generally considered a necessary evil, is invariably sadly neglected. For this, to be sure, there is a reason. It is not an easy matter to determine, and, as a result, generally receives no further consideration than the acknowledgement that its cost is but a question of fuel, water, repairs and labor, and that any other details entering into the account are matters of unnecessary refinement. The machines must work and that is about all there is to it.

It, therefore, becomes necessary for the solicitor to show the operator, first of all, what his power costs per kw.-hr. and what the expense will be to purchase same from the power company.

This problem can be considered from two points of view; first, from a determination of the cost of power generated, and, second, cost of that actually consumed in useful work.

It is necessary to make a distinction between these two conditions for the reason that purchased power under proper distribution will come much nearer the consumption in the latter case than in the former. The first of these results can be arrived at with sufficient accuracy for all practical purposes without making elaborate tests.

But the determination of the actual energy consumption at the various machines is a much more difficult and uncertain matter.

In mines operated exclusively by electricity, the only correct method of obtaining this information is by the use of portable recording wattmeters, the records of which for each individual machine, taken over a sufficiently long period, would provide a good basis on which to determine the power consumption. This, while perhaps feasible for both stationary and movable pumps, is a rather complicated process in the case of locomotives and mining machines. The duty of these classes of machinery constantly changes, and at best, the determination of the energy input can only be a matter of estimate.

However, after much laborious investigation, a figure will be determined showing, at least approximately, the cost of power to the coal company under exist-

ing conditions, which can be used for a basis of calculation.

The purchaser naturally assumes that the power company will deliver current to substations located at points decided upon by him, as a result of which, the power plant at the mine—if one already exists—will be abandoned and disposed of to the best advantage.

In any case, we will assume that the operator has decided upon the substation solution, but is uncertain as to the proper method of delivering current to these places of distribution. It will probably be found that the rate submitted by the power company does not appear attractive in comparison with the estimated cost determined for the generation of the company's own power. A rate at the same figure would show no apparent improvement, but all the reasons for the signing of a contract are perhaps not immediately evident.

Advantages of Outside Power

Among other advantages may be mentioned the following:

First: Whatever plan is adopted, the cost of the substations will be the same. Purchased power will, therefore, eliminate the expenditures necessary for the installation of additional generating capacity at the mine plant. This money can, therefore, be used for other improvements, of which there are always legion to be effected, in or around a coal mine.

Second: It will also insure greater security against shutdowns. This may seem difficult of substantiation, because it is natural to suppose that interruption to the power supply should be quite as frequent in one case as in the other. However, this is not always true. All contracts for furnishing power should contain a penalty clause for failure, through breakdown or other cause, to deliver current for a certain specified time.

It is not necessary that the time limit should be the same in all cases. In gaseous mines a shutdown of a few minutes with a complete stopping of the air currents may prove a very serious matter, and under such conditions the allowable interval of interruption should be as short as possible. The power company if operating in a field containing gaseous and nongaseous mines, and if bound down by a penalty clause, has much more at stake, therefore, than could possibly be the case with the independent operator.

To prevent the loss due to deductions, to discontent and annoyance on the part of the purchaser, the power company will, naturally, construct its transmission line only in the best possible manner, and prevent as far as human ingenuity is capable, any possibility of interruption to the delivery of its product.

There should be but slight danger of this difficulty in a well constructed line, properly insulated and protected, providing it is duplicated and a complete circuit formed between the central stations and the point of application. Intermissions due to breakdowns on one transmission system can then be taken care of by the other.

It might be argued that such conditions should also exist in the case of the coal company building the line, but unless the operator has at his command unlimited resources, he will hesitate a long time before duplicating a transmission line which already has been a matter of considerable expense. On the other hand, the power company in self-defense is compelled to do so, in order to insure an uninterrupted delivery.

Third: The abandonment of the steam plant at the mine will result in economies, the extent of which are not generally recognized.

This refers to the time and money spent on the plant by superintendents, purchasing agents, clerks, etc., and which, although charged ultimately as a fixed expense at so much per ton, is not ordinarily allotted in its proper proportion.

Unlike good will, no value is placed on worry and anxiety, yet freedom from this annoyance is certainly worth considerable money in the operation of a coal mine. The psychological influence of small interruptions to a well oiled organization is felt all along the line and nothing has so disconcerting an effect on systematic and economic operation as power-house delays.

This, to be sure, is a mental influence and not generally regarded in the light of profit and loss. Yet, this very condition frequently decides the success or failure of an operation.

Fourth: The absence of boilers releases a certain amount of coal for market which at times can be sold at a price considerably above that charged for steam fuel. While this feature may be of small moment under ordinary market conditions, there are times when an additional five or six hundred tons per month may be a source of considerable profit to any company.

Advantages Depend on Contract

The advantages to be gained by purchasing power will depend in a great measure on the type of contract concluded. This may be drawn up in one of a dozen different forms.

The salesman, eager to close at as favorable a rate as possible for his own company, sometimes is inclined to advocate a contract which leaves in the mind of the operator—who, it must be remembered, is not an electrical engineer—anything but a clear idea of just what his power will actually cost him.

Undoubtedly, this impression is unintentional, but it is evident that the business of the vender would make much more rapid progress if rates were offered on as simple a basis as possible.

The idea of incorporating a fixed charge based on maximum demand, notwithstanding the perfectly reasonable arguments of the power company, relative to the investment on their part necessary to at all times provide for this feature, should, if possible, be eliminated from the contract.

The power company in the field, prepared to do business on a large scale, at once acknowledges its inability to take care of all comers by demanding an installation and maintenance charge, practically based on the proportion of its generating capacity allotted to each purchaser.

To be sure, the power company is pretty much in the position of a hotel proprietor who never knows definitely how many mouths to provide for, and yet must be prepared to satisfy the wants of all who apply. Those who come pay, of course, indirectly for the "unconsumed increment," but the proprietor has not yet reached the point where the charge is so stated on the bill. The guest would, naturally, resent such high-handed procedure, but would never question the charge if judiciously concealed.

In like manner, the purchaser of power naturally feels that he is subjected to a form of direct taxation for something which should be tariff free, at the same time acknowledging that this charge should be part of the burden which the consumer has to bear.

As far as possible, a sliding scale agreement should also be avoided. It is better to determine beforehand what the probable requirements of the consumer will be and carry on negotiations on the basis of a flat rate, with, if necessary, a guarantee on a minimum consumption.

Even this latter stipulation is possible of omission, for the power company naturally will not be content with one or two customers. The greater the number of consumers, the more readily will the annoying fluctuations and uncertainties of the requirements, adjust themselves to a steady load.

It is far more satisfactory to the generating company to rely on its ability to serve many customers who, in the aggregate, will consume all the power generated and take care of the expenses incidental to the equipment installed, rather than depend on a few customers for a guaranteed consumption each with the unsatisfactory complications likely to arise from this condition.

It does not necessarily follow that power contracts should be concluded between all mines at the same rate. The law of nonuniform charges in a business of this nature has a peculiar application, and no one can consistently take exception to variation in rates governed by

the requirements of local conditions. It does, however, seem but logical that operations in the same locality served from a common transmission line should come within the same category.

However, it is reasonable to assume that the larger the consumer the less should be his rate, not in the light of a special privilege, but as a charge based on the actual cost of the delivered product, subject, of course, to its proportion of fixed expense and the profit naturally to be expected from the transaction.

On first thought, it would appear that the rate per kw.-hr. should, in all cases, be the same, but while there are certain charges that should naturally be borne by the consumer in direct proportion to the consumption, there are others which should be allotted directly in proportion to the number of consumers. This would, of course, decrease the rate per kw.-hr. for the customer having the largest dividing factor.

The fact should not be lost sight of that it is the object of the power company to sell as much of its product as possible, at a profit, to be sure, but also on terms advantageous to the buyer.

Preliminary Arguments

In many cases, much valuable time will be consumed in preliminary arguments tending to prove to the prospective customer any stated advantage in cases where the terms of the contract are involved in more or less indeterminate technicalities.

The advantages of a contract on a flat rate basis are, therefore, apparently obvious.

The discussion, so far, has attempted to show the benefits to the coal company of purchasing power, based on a price equal to the cost of that manufactured in its own plant. Undoubtedly, as a general proposition, a better rate will be offered, resulting in a corresponding additional advantage to the purchaser.

The favorable development of the industry redounds to the profit of the power company, particularly if it has been in the field primarily as a lighting proposition. The increased load factor will make it possible to sell power at a very low rate and yet at a profit.

The great difficulty governing the position of the company first entering this field, is its lack of information relative to the price at which it can afford to sell power. Any effort on its part to regulate the various peak loads in accordance with its capacity, in order to determine this rate, rather than by placing itself in a position to handle the maximum demand of its customers under all conditions, can only result in uncertainty and confusion regarding the ultimate outcome.

The necessary equipment, if installed on the principle of being a public servant, rather than for the benefit of a single consumer, is the only safe and sure method of determining the burden that the traffic will bear.

Improvements in Coal Preparation

By A. J. Reef*

The principal defects of some of the appliances commonly employed in the preparation of domestic coal and how they may be overcome.

Particular attention is given shaking screens and coal chutes of adjustable pitch.

*Assistant chief engineer, Victor-American Fuel Co., Denver, Colo.

Few, if any, managers of coal mines are without their troubles on account of slack being loaded with the larger sizes. This comes from two causes: first, inefficient screening; second, breakage in loading.

The Shaking Screen's Shortcomings

One usually presumes that a shaking screen will do perfect work, but this is not always the case. While operating well enough over the middle part of its area, the slack will frequently creep along the corner angles which are not perforated, and so get into the larger sizes. This has been remedied in the writer's practice by placing baffles at the side of the screen which force all the coal to pass over the perforated portion of the bottom.

Adjustable Chutes vs. Boom Conveyors

Slack, in nut coal, on account of breakage in loading, has become a serious matter in some localities, and in order to obviate it at our own mines, we recently considered installing loading-boom conveyors, such as are put on the market by prominent conveying-machinery manufacturers, but after considerable thought upon the problem, the writer evolved a movable chute which could be slid up or down at will, maintaining meanwhile a constant angle of inclination, which accomplishes the same purpose as the loading boom, at far less cost. This plan was first applied to nut coal as de-

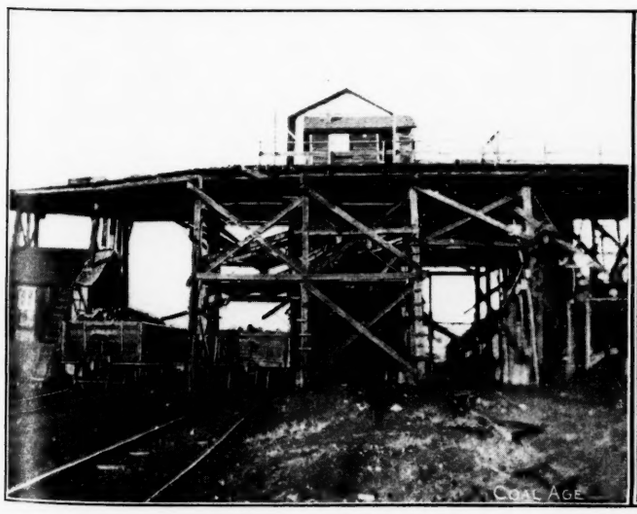


Fig. 1. General View, Tipple and Screen

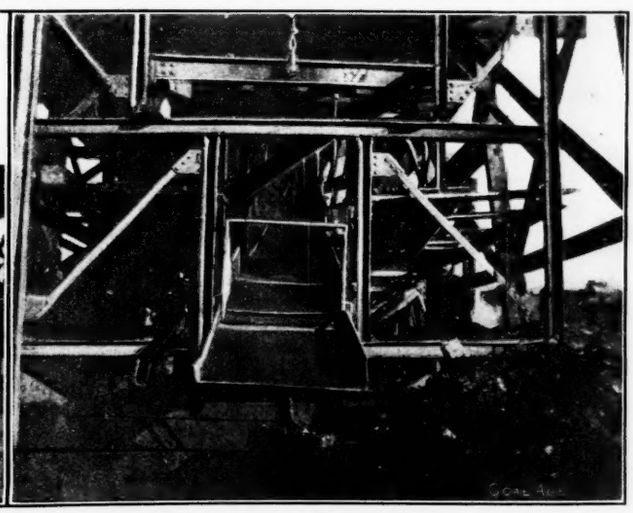


Fig. 2. End View of Adjustable Screen

livered by an elevator from a washery. Later the same general scheme made heavier was used for the loading of lump coal. In this case, however, the whole device is suspended by tackles from the tipple floor above, and can be raised bodily out of the way of box cars, giving a net clearance of 22 ft. from the top of the rail. The peculiarity of this plan lies in slanting the chute down in the direction *opposite* to that in which the car is moving. In both cases it has worked satisfactorily, delivering the coal to the car without any great drop and at a low velocity.

Slack in Box Cars

More complaints are probably received on account of slack in box cars loaded with lump than when filled with any other grade of coal. Our first attempts at correcting this evil were directed toward giving a final screening just before the coal entered the box-car loader. Short sections of stationary bar screen were inserted in the chutes which fed this machine. This helped some, but it did not affect pulverization from the second cause—namely, breakage in loading. It has been the universal practice to feed the box-car loaders over stationary chutes, and even when shaking screens are used, the oscillating portion is at such height as to load open cars, and for the loading of box cars, a long and rather steep stationary chute is always employed. The coal necessarily attains such speed in passing through this latter that it is certain to splinter more or less on striking the loader.

Shaking Screens of Changeable Pitch

The C. S. Card Iron Works, of Denver, has recently installed a number of shaking screens, in which the forward half is suspended from an I-beam frame, which is pivoted at its back end and suspended by a cable at its forward end, so that its pitch, and the pitch of the screen suspended from it, may be changed.

By this method, the shaking screen working on a pitch of from 16 to 19 deg., will deliver directly into the box-car loader. With the front end of the frame raised and when working on a pitch of from 9 to 11 deg., it will discharge nicely into an open car. A new screen of this type, supported as above described, has recently been installed at one of our mines, and is illustrated in Figs. 1, 2 and 3. As an example of rather ingenious but not difficult engineering, it might be noted that the screen frame is built in, under and around the wooden tipple, but is an entirely independent structure, as the photographs clearly show.

The same idea of making the screen shake directly into both box and open cars has been applied to two screens that had already been installed in the usual manner. Fig. 4 is a photograph of one of these worked-over installations. A necessary feature of the arrangement, is that the last four or five feet of the shaking screen is a telescoping chute which can be drawn back under the screen to allow box cars to pass, and run down again as an extension when loading them. Being a part of the screen itself, this chute shakes and the coal drops off its end into the hopper of the loader without any appreciable horizontal velocity.

In operation it is usual to block up the front ends of the I-beams when in their lowest position, letting the rope carry them when in any other. By using a large, multiple winch on the rope the alteration of pitch of the screen is made easy and, in practice, it is raised and lowered, not merely in changing from box to open cars, but in loading a single open car. At the start the screen is depressed to give as little fall as possible, and as the work progresses it is elevated so as to finally top out the car.

This is a radical improvement in screening practice and places all blame for slack in cars of lump where it belongs, on the box-car loader. An improved type of this latter device is ready to be tried out by a machinery firm in Denver, which, if successful, will result in loading lump coal in box cars at the mine with not over 1 per cent. under size.

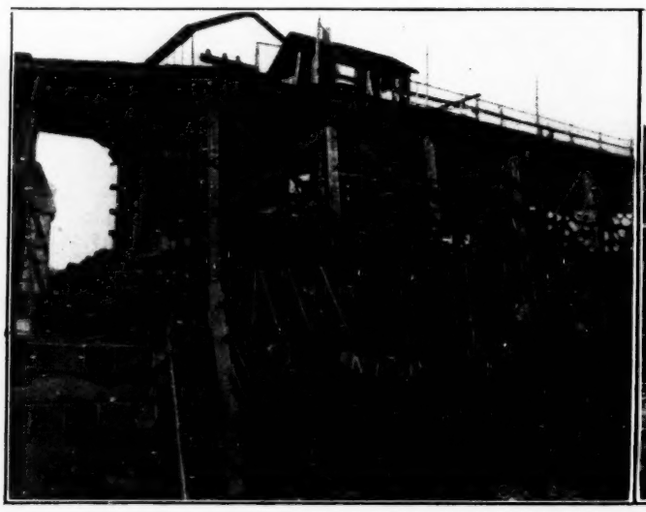


Fig. 3. Closer View of Screen and Tipple

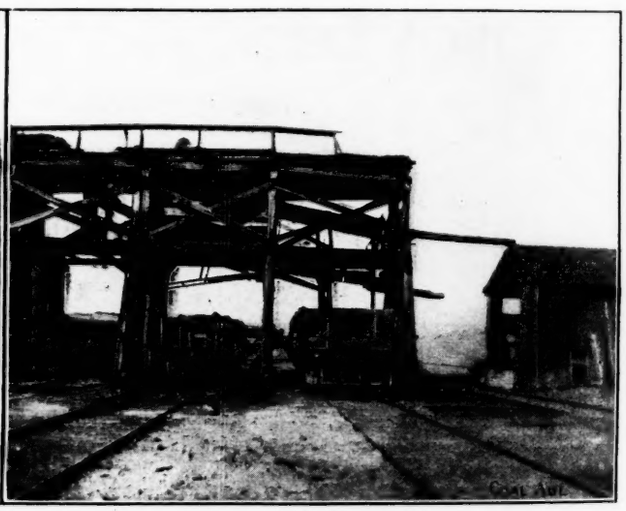


Fig. 4. Another Tipple. Note Telescoping Chute

Coal Mined Less Than a Century

The first mention of the occurrence of coal in the United States, according to the United States Geological Survey, is made in the journal of Father Hennepin, a French Jesuit missionary, who in 1679 recorded the site of a "cole mine" on the Illinois River, near the present city of Ottawa, Ill. The first actual mining of coal was in the Richmond Basin, Va., about 70 years after Father Hennepin's discovery in Illinois, but the first records of production from the Virginia mines were for the year 1822, when, according to one authority, 54,000 tons were mined. Ohio probably ranks second in priority of production, as coal was discovered there in 1755, but the records of production date back only to 1838. The mining of anthracite in Pennsylvania began about 1790, and it is said that in 1807, 55 tons were shipped to Columbia, Penn. Reports of the anthracite coal trade are usually begun with the year 1820, when 365 long tons were shipped to Philadelphia from the Lehigh region. Prior to this, however, in 1814, a shipment of 22 tons was made from Carbondale, also to Philadelphia. It is probable that the actual production prior to 1820 was between 2500 and 3000 tons.

The entire production of all grades of coal in this country in 1911 had a total value of $626,366,876.

An Interesting Tramroad Installation

Special Correspondence

An elevated electric tramroad about a mile in length for conveying coal from the mine to the railroad cars which employs neither third rail nor overhead trolley. No cross-ties or sleepers are used and operation of the system is unaffected by weather conditions. The cars dump automatically.

In various parts of the country, particularly in the Eastern States where the coal measures lie above the railroad tracks, and the intervening ground is broken and uneven, conveying the product of the mine to the car sometimes presents a difficult engineering problem. This is particularly true if the output of the mine is so small as to render the necessarily large comparative expense of building a tram road unwarrantable.

How These Difficulties Are Overcome

A plant designed to meet these difficulties and one which is at least unique in many ways has been in daily operation for about two years at Blossburg, Penn. This transportation line is owned and controlled by the Automatic Transportation Co., of Buffalo, N. Y., from whose catalog we quote in part the following description:

"The line consists of a series of iron posts resting on concrete foundations, capped with malleable iron Y's which support heavy insulated steel rails. The electric carriers or motor cars, which draw several trailers, take the current direct into their motors from the rails upon which they travel, thus doing away with the third rail or overhead trolley. The standard gauge of the line is 30 in.

The point of contact, where the current is taken, is in a V-shaped groove in the under side of the rail, thus making it possible to operate the line under all weather conditions, as snow and sleet will not interfere with the electrical contact.

The elevation of the track varies from a few feet, at several points in passing

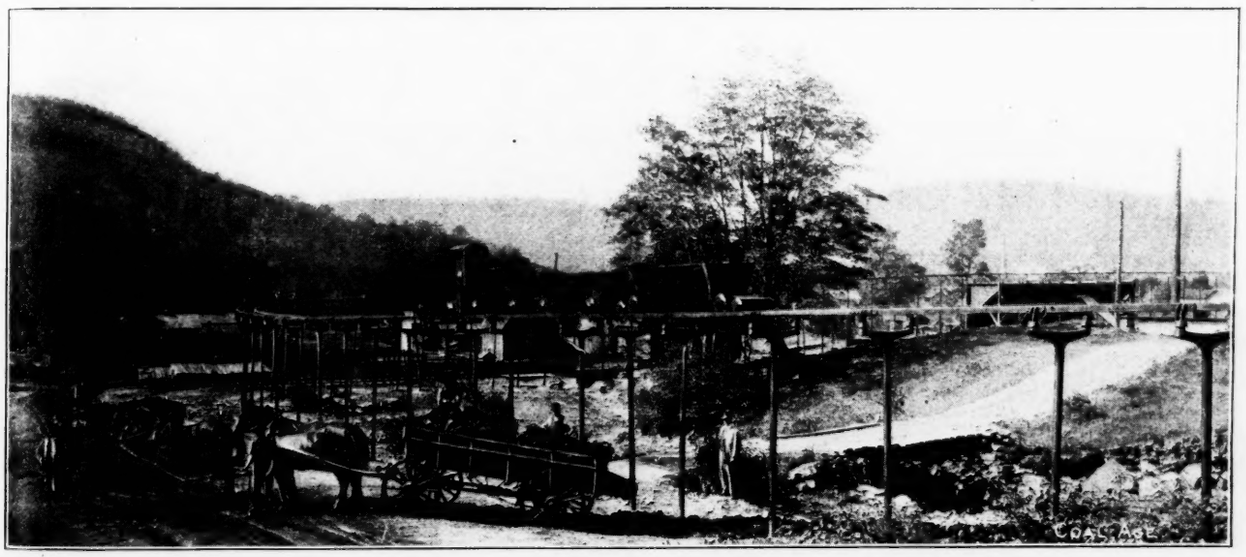


Fig. 1. Trip Approaching Tipple in Summer

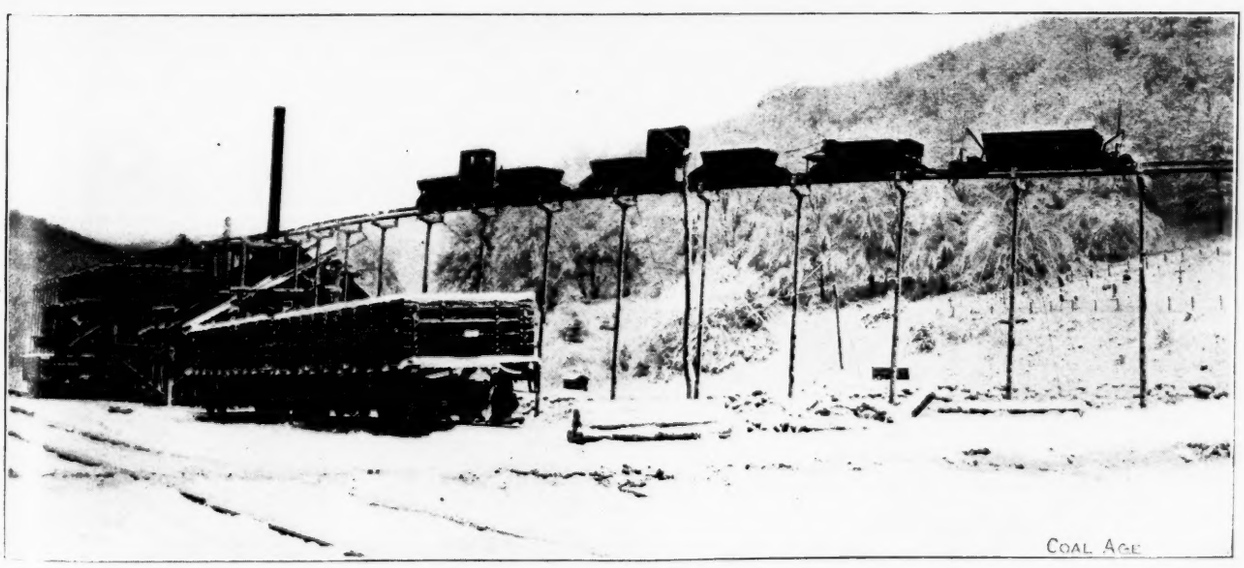


Fig. 2. Trip Approaching Tipple in Winter

down the mountain, to 36 ft. near its foot where the line leaves a high elevation of land and is carried to the top of the tipple at the railroad siding.

The line is a mile long, the greater portion of it being constructed on an 8 per cent. grade. The means of construction employed, does away with the cost of grading, the height of the upright supports varying with the contour of the earth's surface.

Details of Operation

The coal is transported in trains which consist of two or more motor cars, each with a carrying capacity of one ton, and a number of trailers, each conveying a ton and a half in a load. The round trip is made, from loading the cars at the mouth of the mine, proceeding down the mountain to the railroad tipple, automatically dumping the load and climbing the mountain to the mine again, in 10 to 15 min. The line has a capacity of conveying 1000 tons of coal per day."

In the accompanying illustrations, Fig. 1 shows the line in summer with a trip of cars approaching the tipple. Fig. 2 is a view at a slightly different point and under opposite weather conditions, while Fig. 3 shows a trip at the mine bins receiving its load.

Fig. 3. Trip Loading at Bin

A Setback to Electric Shotfiring

By Geo. M. Brown*

A description of the recent explosion in Oklahoma at a mine where the system of simultaneously firing all shots by electricity was in use. Advocates of this method are prone to regard it as infallible, but since this is the second disaster at the colliery within a comparatively short period, the local operators are becoming uneasy.

*Mining engineer, Osage Coal & Mining Co., McAlester, Okla.

On Wednesday evening, Nov. 20, 1912, Mine No. 38 of the Rock Island Coal Co., at Alderson, Okla., was badly damaged by an explosion which resulted probably from a windy shot and ignition of dust. This explosion has some interesting features owing to the unusual conditions which caused it. Fortunately, no one was in the mine at the time.

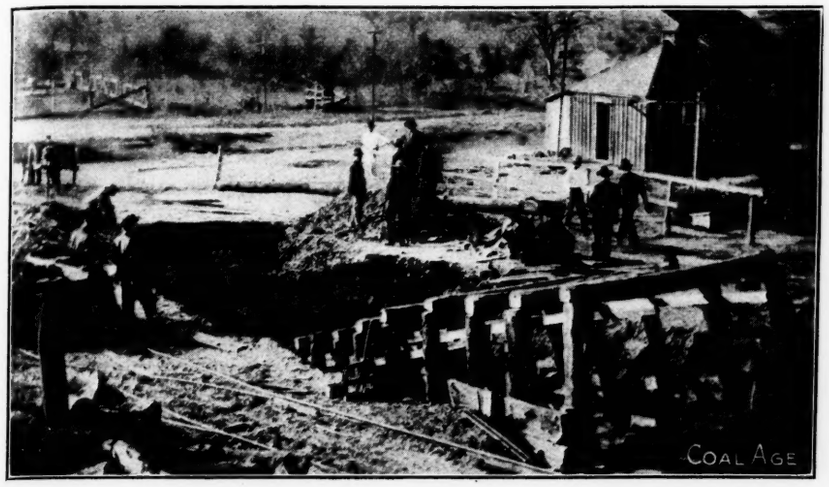
About 18 months ago an electric shotfiring system was installed, all the shots being fired simultaneously by throwing a switch on the surface. Power is obtained by connection with a near-by trolley wire, and five-ampere fuses are used.

In accordance with the state mining law and by agreement, the miners prepare the drill holes and cartridges of powder, but are not allowed to tamp the shot. After the men are all out, two or more shotfirers go down and prepare the shots connecting the wires at this time. Either electric fuses or detonating caps are used. The shotfirers are allowed to judge the shot and need not fire it if they consider it dangerous. The ventilating fan is always stopped when the shots are fired, but in this particular mine, the natural ventilation is strong.

The Explosion

On Nov. 20 the shots were prepared and the shotfirers came out to throw the switches. One went about 200 yd. south of the mine to throw a switch near the trolley connection and one stayed at the slope mouth. After both switches were thrown, the man nearest the mine mouth had time to take out his pocket knife and had started to prepare the switch fuses for the next firing before the explosion reached the surface. The other firer said that he heard several rumbling

Two Views Showing the Wrecked Mine Mouth of the R. I. C. Co.'s Alderson Mine after the Explosion



EFFECTS OF THE EXPLOSION. ALL TIMBERS SHOWN HAVE BEEN REPLACED

noises which ended in a sharp report as the force of the explosion reached the slope mouth.

It is thought that the explosion started at the face of the 7th or 8th West entries, the slope itself having been driven down the pitch almost straight south. Nearly every set of timbers was blown down from the 4th lift upward and the slope mouth was caved in for a distance of 100 ft. The concrete overcast was moved bodily one foot to the east, but it is reported that very little rock fell. A similar explosion occurred several months ago and the damage amounted to about $8000. It is about the same in this instance.

THE REVERSAL OF OPINION CAUSES UNEASINESS TO MINE OFFICIALS

The mere details of the explosion are about the same as usual, but the reversal of the popular theories regarding electric shotfiring in the district, is causing great uneasiness to mine officials. One advantage of the system is that no men are killed. Some advance the theory that if all the shots "go off" simultaneously no explosion will result on account of the balancing concussion. This is probably wrong in view of the distance separating the faces of opposite entries.

In this field it is found that some parts of the McAlester seam are more explosive than others. Mining men look upon the explosion as the result of a windy shot, due to too much powder and a badly prepared drill hole, combined with a dusty and a dry mine.

Several mines in this district are adopting the system of firing by electricity and an explosion, after only a few months of working, is causing a feeling of unrest among mine managers and superintendents. Some said that the system is infallible, which is apparently not true where dryness and dust prevail and too much powder is used. Also, I believe that natural ventilation should be stopped to prevent fresh air from traveling along the entries while the shots are being fired. The question of whether reducing or entirely shutting off the air, at the time of firing, will prove a benefit, is still unsettled.

VIEW OF THE MINE MOUTH, SHOWING NEW TIMBERING IN PLACE

Machine Mining on Heavy Pitches

The question is often asked as to the pitch on which machines can be successfully used for undercutting coal. The most extreme case that has come under my observation is that of the Big Horn Collieries Co., at Kirby, Wyo., where the seam pitches 23 deg. This mine is laid out on the panel system, entries being driven straight down the dip and rooms turned to the right and left on the strike. Thus the machines come into the rooms on the level and cut up and down the 23-deg. pitch, which is so heavy that any loose parts will slide down, and the utmost care is necessary in maneuvering the machine.

The machines used are the Goodman and Sullivan type shortwall machines; a chain breast machine could scarcely be used under these conditions. The bottom is good and comparatively regular, and the coal is quite free-cutting.

It is naturally found much easier when cutting up the pitch, but at the same time no serious difficulty is encountered in cutting down. Under these conditions it has been found practical to cut four to five rooms per eight-hour shift, and the company is thoroughly satisfied with the results it is obtaining. The width of the rooms under these conditions does not influence the number of rooms that can be cut, as most of the time is lost in maneuvering and setting the machine. After the cutting is started, an extra width of 10 or even 20 ft. in the room would not seriously affect the total time necessary to complete the room. Operators who have attempted to cut coal on a heavy pitch will appreciate the difficulties of cutting on the 23-deg. pitch at this mine.

Coal Cutter Troubles

SPECIAL CORRESPONDENCE

Of late years, due to the ever increasing use of electricity, and the constant extension of mine workings, three-phase alternating current has been steadily advancing in its underground application. However admirably this form of energy may be adapted to such work as operating fans, pumps, and the like, it is in its application to small motors, such as are used in mining machines, that its greatest weakness becomes apparent.

A few words, therefore, may well be said concerning some of the practical difficulties which occur in this type of machine as employed in British collieries, and how these difficulties may be avoided.

ALWAYS PULL THE SWITCH

One of the principal causes of breakdowns on such three-phase cutters, and one which is entirely preventable, providing the attendants are sufficiently ex-

pert and careful, is the failure, on the part of the driver, to remove the short-circuiting switch upon stopping his motor. The consequence is that when energy is again applied to the machine, full current at full voltage passes through the windings of the rotor with the result that in addition to imposing a heavy mechanical strain upon the various conductors, due to the rush of current, there is frequently a serious burnout.

In order to obviate this difficulty numerous forms of automatic devices have been tried, but, in many cases at least, these have introduced such complication of parts as to render their usefulness somewhat questionable. Although the use of short-circuiting devices for the slip rings has its advantages in decreasing the resistance of the rotor circuit, and eliminating a large amount of wear on the brushes, under general conditions in colliery practice it is often found better to avoid the use of short-circuiting appliances, allowing the brushes to remain always touching the rings.

There is, of course, a good deal of trouble experienced with slip rings on such three-phase motors, but it may be urged that a great portion of this annoyance could be avoided by the exercise of a little attention to detail. When the brushes are always in use, and in contact with the rings, one of the most fruitful causes of this type of trouble is the kind of brush that is employed.

It is a difficult thing to find a brush which will not only convey the necessary current with sufficient ease to prevent undue heating, due to electrical resistance, but also capable of giving the necessary amount of lubrication to the rings. It may frequently be found advantageous to employ two brushes on each ring, one consisting of copper gauze and the other being a morganite brush used in a box holder, so arranged as to prevent the latter from ever coming in contact with the ring.

This method has been tried in practice, and has been found to be successful in correcting slip-ring difficulties, inasmuch as the gauze brush conveys the bulk of the current, while the morganite brush supplies the necessary lubrication. Morganite brushes alone are also very successful, and in this respect no objection can be found to their application.

All Troubles Are Not Electrical

The troubles encountered in electrical coal cutters are not always of a strictly electrical nature, much being merely the reflection of mechanical difficulties occurring in the machine itself. For example, in some types of machines the drive is transmitted by means of bevel gearing, and it is not uncommon to find, upon close examination, that this gearing is too deeply meshed.

The result is that there is a constant loss of power which manifests itself in overheating of the motor, and, in some instances, fusing on the circuit. Not infrequently, also, this undue meshing of the gearing produces a breakage of the pinion. This fault is perfectly well realized by the makers of coal cutters, and in some types it is found that the mechanism is provided with adjustable collars to compensate the wear.

Unfortunately, it is impossible to render any coal-cutting appliance immune from neglect on the part of the attendant to take up wearing collars. It frequently happens, consequently, that trouble, which is of a purely mechanical origin, may place the use of electricity in a disadvantageous light.

Strict supervision should therefore be given to the mechanical details of the electrical coal cutter, in order to make sure that the electric portion of the device is not being debited with failures which, of right, are not its due, but arise from bad design, or, more frequently still, from the inattention of the operator.

The above cases must only be considered as types. Other trivial defects, if allowed to go uncorrected, are liable to produce results giving an unfavorable impression of the suitability of electric power for coal-cutting purposes.

Who's Who—in Coal Mining

The biographical sketches of prominent coal men, which have been running in Coal Age for nearly a year, have been temporarily discontinued, owing to the mass of other material that must be published before Jan. 1. The "Who's Who" page has proved popular and will be resumed in January of the new year.

Some months ago we asked our readers for suggestions of men whose life story would be helpful, and our recent sketches were based on selections made from the names sent in by interested subscribers.

Only 52 men can be handled in a year, and there are several times that number of individuals whose lives are of sufficient general interest to entitle them to a place on this page.

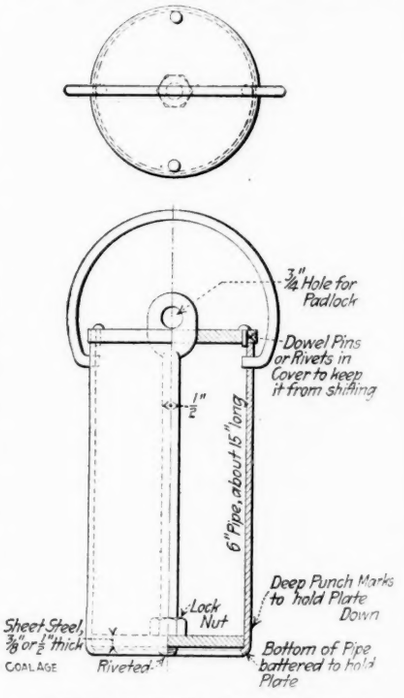
To facilitate our work, and to make these sketches of maximum value, we again request our readers to write us, suggesting the names of coal men whose biographies would be interesting to the industry as a whole. Do this little favor for us today, so that we can arrange our "Who's Who" schedule for 1914.

Preventing Waste of Bits

By H. E. Moon*

At coal mines where a number of chain machines are in use, the loss of cutter bits frequently amounts to a considerable item in the course of a year. This is due to the system usually in vogue for transporting the bits from the men in the mine to the blacksmith and back again.

I have found that the machine men usually throw their dull bits into an empty powder can and then send them to the surface on a trip. When they arrive at the surface they are thrown on top of a loaded car, and, nine times out of ten, land bottom side up. They are gathered up by a boy, put back in the can, and carried into the blacksmith shop. If they happen to be scattered, he picks up only those near the can and the rest are left to be trampled into the ground and lost.


3/4" Hole for Padlock
Dowel Pins or Rivets in Cover to keep it from shifting
1" Pipe, about 15" long
Deep Punch Marks to hold Plate Down
Lock Nut
Sheet Steel 3/8" or 1/2" Thick
Riveted
Bottom of Pipe battered to hold Plate
COAL AGE

Chain-machine Cutter Boxes

This loss amounted to so much at the Robinson mine of the Colorado Fuel & Iron Co. that their repair and supply man, John A. Madle, experimented on various boxes, and finally adopted the box shown by the accompanying sketch.

The box is made of a piece of 6-in. iron pipe, about 15 in. long, with a sheet-steel cover and bottom, a bail to handle it by, and a padlock. The name of the machine runner and his location in the mine are shown on the box. The runner and the blacksmith each have a key to the box, which is practically indestructible and cannot be broken open by rough handling. The box holds 70 to 80 cutter bits.

*Denver, Colo.

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This journal is interested solely in matters relating to the fuel industries, and is designed to be a medium for the free interchange of ideas, the detailed description of coal-mining practice, and the expression of independent thought calculated to benefit both operator and miner.

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COAL AGE

Mine Concreting

In this issue we print the first of a series of articles which are to appear at intervals in COAL AGE during the next few months, and which will deal with the principles of concreting, with special reference to coal plants. We believe that the possibilities of cement for use in and around coal mines have never been thoroughly understood or fully developed. The average coal engineer seldom has more than a superficial knowledge of the theory of design in concrete, and the result is that many errors in construction are observed around colliery plants.

In addition to this, the scope of usage is being rapidly broadened. Concrete lining for shafts is one of the oldest forms of application, and this is now generally accepted as good practice by the most conservative engineers.

The Ahmeek Mining Co., at Ahmeek, Mich., anticipated developments in this direction by several years and designed a concrete slope timber. These have met the test of hard practical usage in a satisfactory manner and were delivered at the shaft mouth at a cost of $22.50 per set, as against $37.50 for a timber set.

It is well to remember in this instance, however, that several unforeseen disadvantages developed during and after the installation. For instance, because of the additional weight, it was found necessary to increase the erecting gang by one or two men. And, because of the great rigidity of the concrete set, as compared with timber, the cost of skip repairs increased several hundred per cent. This latter trouble was overcome by molding wood strips in the concrete.

It is our intention to cover every possible detail in coal mining to which concrete might be adapted, from a brattice to an engine foundation. If any of our readers have suggestions to offer in this connection, we would be glad to give them our consideration. Mr. Seelye, author of the articles, is a man of broad practical experience and is thoroughly posted in the theory of concrete structural design. Mr. Shurick, of the COAL AGE editorial staff, will collaborate with him.

Employers' Liability and Workmen's Compensation

We devoted our foreword in the Nov. 30 issue of COAL AGE to a brief discussion of indemnity and compensation acts for workingmen. Attention was called to the excellence of the German laws dealing with this question. It was stated further in the foreword referred to that an industrial insurance law is clearly a measure regulative of interstate commerce, and that Congress has power to pass such a law, even though its ulterior object be a police regulation of our coal mines.

To substantiate this opinion we will quote the words of Justice White, of the U. S. Supreme Court, in the employers' liability cases (Howard v. I. C. R. Co., 207 U. S., 463). He writes as follows:

The proposition that there is an absolute want of power in Congress to enact such a statute (industrial insurance law) is based on the assumption that, as the statute is solely addressed to the regulation of the relations of the employer to those whom he employs, and the relation of those employed by him among themselves, it deals with subjects which cannot, under any circumstances, come within the power conferred upon Congress to regulate commerce.

As it is patent that the act does regulate the relation of master and servant in the cases to which it applies, it must follow that the act is beyond the authority of Congress, if the proposition just stated be well founded. But we may not test the power of Congress to regulate commerce, solely by abstractly considering the particular subject to which a regulation relates, irrespective of whether the regulation in question is one of interstate commerce. On the contrary, the test of power is not merely the matter regulated but whether the regulation is directly one of interstate commerce, or is embraced within the grant conferred on Congress to use all lawful means necessary and appropriate to the execution of the power to regulate commerce.

We think the unsoundness of the contention that, because the act regulates the relation of master and servant it is unconstitutional, because under no circumstances, and to no extent, can the regulation of such subject be within the grant of authority to regulate commerce, is demonstrable. We say this because we fail to perceive any just reason for holding that Congress is without power to regulate the relation of master and servant to the extent that regulations adopted by Congress on that subject are solely confined to interstate commerce, and, therefore, are within the grant to regulate that commerce, or within the authority given to use all means appropriate to the exercise of the powers conferred.

To illustrate: Take the case of an interstate railway train; that is, a train moving in interstate commerce, and the regulation of which, therefore, is, in the nature of things, a regulation of such commerce. It cannot be said that because a regulation adopted by Congress as to such train when so engaged in interstate commerce deals with the relation of the master to the servants operating such train, or the relations of the servants engaged in such operation between themselves, that it is not a regulation of interstate commerce. This must be, since to admit the authority to regulate such train, and yet to say that all regulations which deal with the relation of master and servants engaged in its operation are invalid for want of power, would be but to concede the power and then to deny it; or, at all events, to recognize the power and yet to render it incomplete.

From this conclusion of Justice White, and after reading similar decisions of other eminent jurists, we are sure that a proposed industrial insurance law, being a regulative measure of a purely economic character, will affect not only the business of *employers* engaged in interstate commerce, but will also affect the rights of *employees* so engaged. As a consequence, such a law is clearly a measure regulative of commerce between states.

If the foregoing statement is true, it follows that Congress has power to pass such a law, even though it necessitates a police regulation or federal inspection service designed to promote the public welfare of the people of the United States. The lottery and pure-food statistics are instances of legislation directly analogous in important essentials, to a limited workmen's compensation law.

Nothing in our industrial life is of more vital importance than a proper and sensible law covering industrial insurance. If such legislation is within the province of our federal Congress, there should be no delay in taking action on this matter. And when a solution for the problem is sought, great aid will come from a study of the German system.

The German government provides that the employees in hazardous occupations be divided into seven classifications. The miners come under the first class, and grouped with them are the workers in steel plants. The employers classified under each heading must arrange for a sufficient fund to meet the payment of benefits and pensions. Thus each occupation pays the cost of its own insurance.

One of the most interesting facts in connection with the German plan is the arrangement whereby the insurance to be paid by the mine owners for their employees varies inversely as the dangers to which the workers are exposed. That is, the operator who has the best equipped mine pays the least insurance for his employees, and the company that refuses to make improvements is obliged to pay a higher rate. When this latter concern has entered the highest class of premium payers, and still refuses to comply with the regulations, of the "Mutual Employers' Association," it has to pay a fine equal to the annual premium. This arrangement has resulted in an extraordinary competition among employers to see who can do the most in safeguarding the miners.

The German system of industrial insurance is not perfect, but it is so far ahead of any scheme prevailing in any other country that for our purpose it may well be considered a model plan. It has created better relations between employer and employee, a higher grade of efficiency among the miners, fewer costly damage suits, and a decrease in the mortality of underground employees. Prof. Seager, of Columbia University, sums up the matter in the following words: "The adoption of her elaborate system of workmen's insurance was coincident with the beginning of a period of industrial expansion that has brought Germany to the front rank among the commercial nations of the world."

In succeeding issues of COAL AGE we will continue the discussion on this subject, in the hope that the interest of all our readers will be aroused to the necessity of proper workmen's insurance laws in the United States.

The Black Frost

The farmer has long regarded a black frost with apprehension. Those freezing nights which are unaccompanied by sufficient moisture to protect the earth from evaporation and where the cooling is not delayed by the preliminary need for the freezing of moisture, an operation involving much heat, are not so cold though they may be more raw than the nights of the black frost.

To the miner that same type of night presages no less disaster. Little is to be feared when the air is moist and frost is falling. Cold weather when snow is on the ground is rarely menacing. In Colorado, it is to be noted that the air is much less dry when a mantle of snow covers the hills. If it were not that the water entering the mines in spring and fall keeps the measures more or less damp, the black frosts would be terribly deadly in their mine-drying action.

In any event it is well to be forewarned and to beware of the cold rimeless nights. The mine operator should concern himself, not with the winter wheat or spring fruit, but with the subterranean dangers of which this manifestation of thirsty nature gives him unmistakable warning.

As the superintendent sits in his office drooling out his condolences to the farmer or regretting that the fruit is all spoiled, let him give at least a thought to the increased dryness of the mines which the black frost has caused.

Importance of Mine Maps

Economical mining is next to impossible without good mine maps. Five minutes' study of a good plan is often more profitable than weeks of investigation and work in the mines. Maps give a grasp of details, an idea of the relationship of locations, a sense of proportion, a unity of perception and a perspective of the vertical elevations not otherwise obtainable. They are also of untold aid in rescue work, in reëstablishing ventilation and locating the dead or injured. The miner who is familiar with the map of the mine in which he works knows at once the location of dangerous workings and the way of escape from the same. One map should be on such a scale as not to be unwieldy, that it may give the manager at a glance a conception of the whole mine.

A Four Track Steel Tipple

Our front cover last week showed the four-track steel tipple at the No. 2 Mine of the United Coal Mining Co., at Christopher, Ill. It was built to handle the tonnage for one of the largest mines in the state, where large outputs have become quite ordinary. The plant at this mine is designed to hoist at least 4000 tons per day of eight hours, and the tipple equipment is designed to handle this large tonnage and screen and prepare it for market in the best possible manner.

This apparatus consists of a pair of Bond self-dumping cages, a weigh hopper for weighing the run-of-mine coal, a receiving hopper, into which the coal is dumped from the weigh hopper, and a reciprocating feeder for distributing the material to the shaker screens.

These screens are of the Roberts and Schaefer standard roller type, and are 10 ft. wide, and of sufficient length to span four railroad tracks. The upper screen has a double deck for making slack and nut coal separately, while the lower one is single deck and makes the egg coal. The lump is loaded from the extremity of the lower screen by means of a curved-end loading chute which can be adjusted for delivery into high and low cars with the least breakage.

The egg and nut are each rescreened in chutes beneath the shakers, and delivered to their respective cars by end-loading chutes, which are also arranged to raise and lower. The slack removed from these coals is carried by a small conveyor and delivered into the car on the slack track.

Taken altogether, this equipment represents a most perfect arrangement for sizing and loading coal.

It is part of a complete plant designed and built at this mine by the Roberts and Schaefer Co., engineers and contractors, Chicago, Illinois.

Coal Mining in a City Park

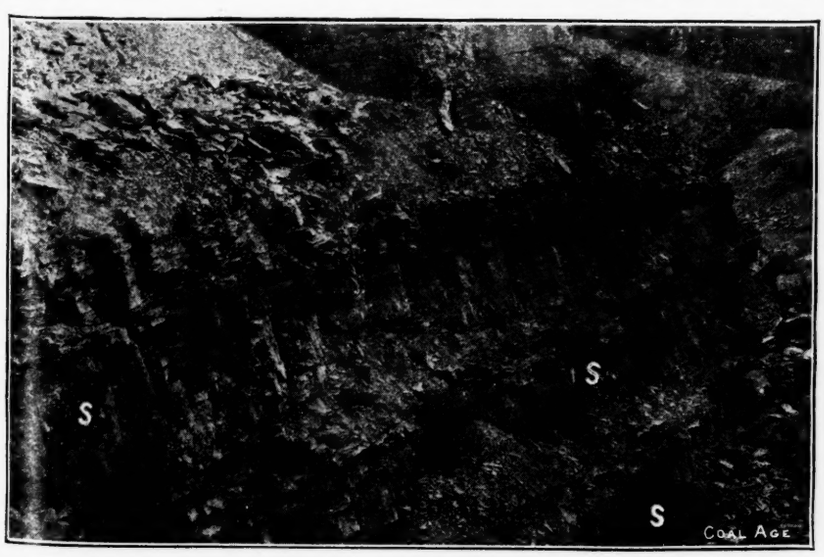
By F. Webster Brady*

Most city parks have their zoos, museums, floral displays, band concerts, and such things that make them as similar as two peas. But the honor of being distinctive, with a real and an exclusive difference, belongs to Nay Aug Park, of Scranton, Penn. Here the visitor views with wonderment a real anthracite coal mine. And he does not have to go underground to see the coal seams and the mining operations—for it is a mine with the roof off. Two miles or so down the valley there is a regular mine shaft with its hoisting plant and towering breaker and from this shaft mining operations have been carried on in the same seams that either crop out in or under the park.

The work has been done to accommodate certain persons who wanted the rocky bluff removed. Eventually the gangways from the far-away shaft will come out through the face of the seam in the park, and then the coal will be hauled underground to the breaker. The remaining rocky bluffs over the coal will be utilized by the large stone crusher plant in the rear of the views shown in the photos, and the colliery will disappear, except that right in the center of the park is a gated mine entrance, which is one of the permanent exhibits of the place. In this the visitor may follow the coal seam for some distance.

*609 Gibson St., Scranton, Penn.

Anthracite Outcrop (S) in Nay Aug Park



Outcrop of Anthracite Seams Shown at S,S,S

Compressed Oxygen Rescue Helmets

In our issue of Nov. 2, 1912, page 610, we used an illustration entitled "Rescuemen Removing Injured Man from a Mine." This picture, forwarded to us by the author of the article, was arranged and photographed by G. T. Haldeman, mine rescue engineer Lehigh Valley Coal Co., Wilkes-Barre, Penn.

Electrical Number Out of Print

The demand for our Dec. 7 Electrical Number of Coal Age has been so great that the entire issue of 10,500 copies has been exhausted. No further orders for this number can be filled. Commencing with this current issue, we will print 11,000 copies of Coal Age weekly.

Discussion by Readers

Comment, Criticism and Debate upon Previous Articles, and Letters from Practical Men

Reducing Ventilation at Firing Time

My coal-mining experience began in Blantry Colliery, Scotland, some thirty-four years ago. The mines generated much firedamp and were dusty, which conditions were responsible for two heavy explosions. At that time coal dust was not considered dangerous.

After two years I went to the north of England and was employed in several mines in which explosions occurred. At the Trimdon Grange Colliery I saw for the first time some attention given to coal dust; that was twenty-seven years ago. I was employed, at that time, to accompany the shotfirer. We were required to sprinkle the places with water before firing the shots. This sprinkling was done with a squirt gun and water bucket.

About the same time permissible explosives were being introduced into the mines, and I was appointed to accompany the experts engaged in testing the different kinds of explosives used in our mine. I learned from these men that the more air that could be brought into the vicinity of the blasting, the less would be the danger.

I then came to the United States, twenty-four years ago, and reached Pittsburg, Kan., at the time of the Frontenac and Fleming explosions. I at once went to work at the Fleming mine; the shotfiring law had just been passed and shotfirers were employed at this mine. It was their duty to enter the mine after all other employees were out and, after examining all shots and condemning those they believed to be unsafe, fire the balance.

The first shotfirers employed lost their lives and more were secured. The new men had served but a short time when there was another explosion, and they, though rescued, were crippled for life. The mine superintendent requested me to take the place. Before accepting, I made a careful examination of the mine, but found little firedamp.

I selected a careful and competent miner, and we agreed to do the shotfiring. In performing the work we were very careful and if a windy shot occurred we allowed that section of the mine where it was to cool down and gave time for the powder smoke to clear out. We would then return to the place, investigate the cause and discuss some method to prevent its recurrence. We finally discovered that the danger came from two points in the mine near where we finished our work each night.

The Kansas coal seam was only 36 in. thick and intersected with clay veins; the system of ventilation was the double-entry system, and the back entry was not brushed; the fan was an exhaust; the hoisting shaft was the downcast; the air was split on the main-shaft bottom, each side of the mine receiving about 25,000 cu.ft. of air per minute. This air was carried along the main haulage roads to the faces of the main entries, where it was again divided. The main haulage roads were 6x6 ft., area 36 square feet.

Owing to the clay veins and the cost of cutting the same, the airways are much reduced in all the mines in Kansas, being about 3x4 ft., or 12 sq.ft. area. It was in the rooms on these contracted airways where all the former explosions had originated. By the most careful inspection, however, we were unable to find any fault with the shots in these places. The management cleaned out all the coal-dust deposits it was possible to remove and used water freely; but windy shots still continued in these rooms, blowing down doors and stoppings every night.

It was now decided by the management to speed up the fan; but to this I could not agree, owing to the danger, which I believed would be increased thereby in those places where we had the best air in the mine. We agreed, however, to try it for one night and exercised greater care than usual on that occasion, shooting but one place at a time. On approaching the danger point we took the precaution after lighting a shot, to cross over to the opposite side of the mine for safety. This was all that saved our lives. An explosion occurred that crossed the shaft and caught us even there. We were knocked about and bruised a good deal. We were both overcome and lay there unconscious for two hours.

After this accident my partner quit the mine. I was offered a premium to shoot this mine alone. I accepted the premium, but had the fan slowed down; then when I entered the mine I opened the doors between the downcast and upcast shafts to short-circuit the air traveling in the mine. This prevented further explosions in that mine.

Some two years later, the Keith & Perry Coal Co. opened a new mine, a mile north of Scammon, Kan. The mine had had two explosions when they sent for me and asked me to take the position of shotfirer, for which they were willing to pay a premium. I was permitted to select two men as helpers. I had the fan slowed down and opened the separation doors between the two shafts so as to short-circuit the air. The mine foreman did not believe this was the proper thing to do, but we fired the mine in this way for several months and had no trouble. The foreman cleaned out all the dust, as far as possible, and sprinkled the roads, but gave orders that the fan must be run at the regular speed. I was told not to prop open the doors, but I disregarded this order and set open the doors until all the shots were fired, except seven in the danger zone.

After consulting with the other shotfirers and explaining to them the danger, I agreed to fire the remaining seven shots with the air current traveling to the face of the entry. Having selected a place to protect ourselves on the opposite side of the mine, we lit the shots and made a hasty retreat. An explosion followed that destroyed the doors and stoppings on that side of the mine; but we, fortunately, escaped to the surface uninjured. After this wreck was cleared up, the fan was slowed and the doors were allowed to stand open when firing, and we had no more trouble.

Some ten months later the foreman at this mine was changed. The new foreman notified me that, as he considered the danger in the mine was past, my premium would be discontinued. I resigned my position and new men were secured to do the shooting. On the fifth night after the change there was a heavy explosion and the flame coming out of the mine set fire to the tipple. I was about 400 ft. from the mine at the time the explosion occurred and headed a rescue party. On descending the mine, we found the mules burned and several of them in the sump; the stoppings blown out and the mine wrecked. I knew where the explosion probably started and went directly to that point. In forty minutes we had found the shotfirer almost buried with wreckage, but succeeded in reviving him after five hours of hard work.

When this wreck was cleared the management again requested me to shoot this mine and willingly paid me a larger premium than before. I continued to do the shooting for two more years at that mine and, although the dust was not removed and no sprinkling done, yet there were no explosions.

ALEXANDER MCALLISTER.

Croweburg, Kan.

Should Mine Fans Be Built Reversible

Letter No. 27—Referring to the discussion on reversible fans, I have been much interested and, at times, slightly amused by the peremptory manner in which some of our eminent mining engineers have discussed the subject. Because the conditions in the mines of which they have had charge have never required that the air current be reversed, they assume that it is unecessary to build mine fans reversible. In my experience of over half a century, during which time I have filled every position from trapper boy to superintendent and general superintendent, I have installed many fans, but have always considered that some arrangement should be made so that the air current in the mine could be reversed, if need be, on short notice.

In most cases, I believe the mine can be so arranged that the air current can be reversed simply by opening three doors and closing three other doors, without changing the fan. This would probably take five minutes. Such an arrangement can be installed at a cost of about fifty dollars, more or less.

No engineer or foreman can afford to take chances by failing to provide some arrangement for reversing the air current in the mine in case of need. To take such chances seems to me much like the man who does not insure his house because he does not expect it to burn.

In reference to the argument that some "fool foreman" might reverse the fan, in case of accident, and that this might cost the sacrifice of many lives, I would not consider such a man much of a foreman. I have found, in my experience, that the foremen in charge of the ventilation of large mines are as intelligent as most engineers, as far as the ventilation of mines is concerned; and they have the advantage of knowing every corner in the mine. If a superintendent has a foreman in his employ who is liable to do the fool trick, he had better pay a better salary and get a more intelligent man.

In arranging the ventilation of a mine, with respect to the possible need of reversing the air current, it seems to me there are four questions to be answered:

1. Is the nature of the dust produced in the mining of the coal such as to create dangerous explosive conditions, requiring special arrangements for safeguarding the mine?

2. Is an outburst of gas to be expected in mining the seam?

3. Are the climatic changes of temperature such as to require a change of the air current in winter, to prevent freezing or for other cause?

4. Are there any unforseen conditions that may require the air to be reversed?

In closing, I will say that I have found it convenient, many times, to reverse the air current, both in winter and at other times. I have often been glad to reverse the current to carry off a blower of gas that would otherwise prevent men from working in their places. In one of our mines, this year, we had two splits of air maintained independently by two 6-ft. fans. It became necessary to stop one fan for six days. On that occasion, by reversing the current I was able to ventilate both splits with the other fan and thus avoid laying off 40 men. I cannot imagine a mine where it may not, at some time or other, be necessary to reverse the air current.

JOSEPH VIRGIN.

Bancroft, W. Va.

Letter No. 28—I have read with great interest the recent discussions, in COAL AGE, of different mining men, for and against the installation of reversible mine fans. I believe that this discussion will result in much practical good to the mining fraternity in general, because it is one of the few ways whereby mining men in all parts of the country can become familiar with the conditions under which other men are working or have worked.

After all has been said and looking the matter of the installation of reversible or nonreversible fans, in mines, squarely in the face, and from an unprejudiced broad standpoint, is it not a fact that each party in giving his opinion, for or against reversible fans, has based that opinion to a great extent on his own particular experience, which in most cases has been confined to a certain section of this large country where so many different mining conditions exist.

All of the letters that I have read, in COAL AGE, relative to this matter, have contained valuable data, both for and against reversible fans. Many strong points have been advanced in favor of reversible fans, and the most I have seen against them is the fact that they might and probably have been reversed at times when they should not have been. I believe that is the only good point that has been argued against the reversible fan; and that has been discussed so thoroughly by some very able mining men that it will have the effect of making men think seriously, in case of mine fires, mine explosions, etc., and cause them to consider carefully the conditions existing at any particular mine, before reversing the fan, in a manner they might not have done before reading and studying this broad discussion on the subject. We are all getting the benefit of the other fellows' experience.

Personally I am in favor of installing reversible mine fans, for the simple reason that in case of an explosion or mine fire, it may be necessary some time, at almost any coal mine, to reverse the fan as the only means of saving life or expediting the work of recovering the bodies after such a disaster. There are, besides, many other reasons for reversing the fan: such as keeping the hoisting shaft or slope from freezing during the winter season; taking advantage of the motive column caused by the difference in temperature at certain periods of the year; the humidifying of the air current by means of steam. The strongest point in their favor, as I see it, is that the fan does not have to be reversed unless it is considered absolutely necessary to do so in order to save life or property, and then it may be the only way out of a terrible situation.

I would dread the feeling of remorse that must haunt a mine manager who had installed a nonreversible mine fan and had the misfortune to experience an accident in his mine, and it was shown that had the mine fan been reversible there might have been a single life saved. Let the reader suppose that *one* was his boy, his father or brother, and say would it not justify the installation of a reversible fan.

The whole thing, it seems to me, may be summed up as follows: the reversible fan will meet any emergency that can arise regarding ventilation, but the nonreversible fan cannot meet certain emergencies and, as I said bfore, the only good argument against a reversible fan is that some fool mine foreman may reverse it at the wrong time. However, in the present age of advanced mining, fool mine foremen are scarce, and we can well afford to waive this one argument and install reversible mine fans at all mines, and so connect the "life line" as to give the maximum safety to all engaged in the hazardous work of coal mining.

It is important to place competent men in charge of positions of great importance—men who realize the danger of making any change as important as that of reversing the air current in a coal mine before discussing the conditions thoroughly with other competent men and trusting to their judgment, rather than install a mine fan that cannot be reversed. The chances are that some day we may acknowledge that had we installed a reversible fan, some lives could have been saved.

Some men use the argument that they have had reversible fans installed at their mines for years and have never had an occasion to reverse them. Those men should consider themselves fortunate. The argument, however, implies no certainty that conditions may not arise tomorrow that will require them to reverse the fan to save life. Let us, then, connect the life line, so that should the occasion demand it, we may be able to use this means to the greatest advantage, in saving lives and protecting property.

JAMES MARTIN,
Mine Inspector, Seventh District.
Charleston, W. Va.

Sociological Department

For the Betterment of Living Conditions in Mining Communities

Homely Advice to a Rescue Superintendent

SPECIAL CORRESPONDENCE

Trinidad, Colo., July 14, 1912.

Dear Jack:

I got your letter yesterday telling me you had a bunch of oxygen helmets sent you by your company and you had been ordered to train a rescue crew with them right away and you want my advice about them and how to go at it.

Well, Jack, in the first place you should ought to have at least five helmets, with two men out of the mine, one off the day shift and one off the night shift, for each helmet. Don't take any volunteer who may choose to offer himself, but pick your men. Get men that you *know* are cool-headed, strong, with plenty of gumption and afraid of nothing except booze.

You want to remember that a helmet is a whole lot like an airship. If it and your insides are alright you can go places with it that you can't go any other way, but if either one gives out you're up against it. If you're in an airship and it or your nerve gives out you're coming back quick, and if you're in a helmet and that happens, you ain't apt to come back at all, except with one man at your head, another at your heels and a stretcher beneath you.

A helmet is a wonderful thing but it ain't no good unless the man in it both understands it and knows how to take care of himself. I have a picture that was took of me once when I was going into a mine that had blew up with a helmet on, and another picture that was took about an hour after shows me coming out of the mine on a stretcher. I just hadn't savvyed the valves right.

You might think that from what the people says that makes them, that if you're in afterdamp or smoke with one on that you're just as safe as though you was in God's pocket, but I want to tell you that that's where you'll be unless you and your helmet are both alright and you can't be sure that your helmet is O. K. unless you understand it thoroughly.

Take one to pieces and learn all about how it's stuck together and what each part is for, and then learn the men the same thing. You needn't use up much time having them go into rooms full of sulphur smoke to show them what the helmets will do; once for each man will be enough to do that.

What you want to do is to test the men and the helmets at the same time. Take them into the mine with them on. Make them walk fast to show them what'll happen if they use more oxygen than they're getting. If they choke up and go down, they'll know better next time. Take them into a dip entry where you know the air is good and tell them they are in a body of blackdamp that would kill them in a minute if they didn't have the helmets on; test their nerve.

Fix the helmets some way so they won't work and make them find the trouble and fix it. Test their knowledge. After the shots are fired some night, send word to the five men that are off shift that you think there is something wrong inside and that you have gone in and for them to come on. Test their judgment. On Sundays, when both crews are idle, you can hide two things about as big as men's bodys in two rooms in different entry's about the same distance from the outside and send them in to find them and bring them out. Just tell each crew which entry they are to look in and give a prize to the crew that gets their find out first.

Test them every way that you can think of, but don't test their loyalty. Make it *worth their while* to stay with you. A man's most apt to stay with the job that pays him most and a man who is willing to put on a helmet and knows what to do and how to do it when he's got it on is sure worth more to you than he was before he begun training. Rescue work ain't no picnic, and the men who are going to be the first ones in in case of trouble ought to be able to notice a little change for the better on their pay checks.

After they find out that it pays to be a helmet man you'll have no trouble getting men to train. Its alright to have a few extras on the string coming up, but you must remember that a few well trained men are way better than a big bunch of half-trained ones.

Fix it so that there is at least five helmet men off shift all the time. Don't let one work a double shift if that only leaves you four on the outside. The reason it is best to take men out of the mine for this work is so as to have men who are used to the mine and who will know where they are when they are in there.

Have a helmet for each two men and have those two keep the helmet in shape. Examine them yourself every once in a while and see that the rubber on it is in good shape and that the leather is soft and pliable, and where the tubes are fastened on are tight and well bound.

Be sure that the pressure gages are working right, and while you're testing things don't forget to test the pressure in the big tanks of oxygen every so often. The superintendent that comes out best is the man that is always ready, and if you want the most good out of your helmets and helmet men, you've got to have them ready to get busy at any minute, day or night.

I think that no less than five helmet men should go in at first. It may be that something may be found that would make it necessary for word to be sent to the outside and that would take two men back. (Never send one man alone.) That would leave three men to still go ahead and in case anything happened to one there would be two there to help him.

The next time you write I want you to tell me just what you would do if you was to see a big black cloud of smoke come out of your slope mouth some day and your fan go all to smash; that you knew you had an explosion on your hands. This is a question every superintendent in the country should figure on and decide beforehand just what he would do first. When I hear from you I'll tell you what I would do in a case like that. Hoping that you'll never need your new helmets for anything but practice, I remain as ever

Your friend,

BILL JONES.

Vocational Schools

On Nov. 16 we gave the first part of the proposed curriculum for evening occupational schools. The following list completes the scheme of study. We wish to call attention to the ambitious attempt to give almost a complete view of the underlying principles of mining science.

After graduation from such a school, a practical man should have no difficulty without further coaching, in meeting any question likely to be propounded at an inspector's examination. Wherever school boards are sufficiently enlightened to add such occupational features to the work of the schools, the general tone of the community will be raised by the advance of knowledge and accompanying refinement and by the influx of the better class of mine workers, who will be drawn to the locality by such advantages.

The following are the subjects to be taught at the new vocational schools in

addition to those already set forth in the foregoing issue:

MINE GASES

Formation of the coal measures. Meaning of the terms: mass, volume, density, specific gravity, matter, atoms, molecules, elements, chemical compounds, mechanical mixtures, atomic weight, molecular weight, symbols, chemical equations. Composition of the air. Boyle's Law (Mariotte's). Gases common to the mines and their origin, occurrence, behavior and detection.

MINE VENTILATION

Force of gravitation. Mass of a body. The universal law of gravitation. Law of weight. Laws of falling bodies. Pascal's Law. Quantity of air necessary. Principles of mine ventilation. Pressure and resistance. Laws of friction of air currents. Formulas for the calculation of the volume, pressure and horsepower of an air current. Distribution of air currents by splitting, doors, stoppings and regulators. Effect of temperature upon the volume of air. Ventilating appliances; furnaces and fans. Principles of the water gage, anemometer, barometer and thermometer. Study of the advantages and disadvantages of the various kinds of fans, and the calculation of their horsepower and efficiency. Problems in mine ventilation.

MINE SURVEYING

Scales. Plotting and measurement of distances. Measurement of slopes. Plotting surveys. Calculation of areas and volumes. Drawing of cross-sections of workings. Freehand sketching of wagons, doors, etc.

REPORTS AND ACCOUNTS

Making out of the daily reports of the boiler and engine room; coal consumption, water consumption, weather conditions, gage pressures and other conditions which effect the efficiency of the plant.

ACCOUNTS AND ESTIMATES

Keeping of time, cost and progress sheets. Making out of bills of lading, checks, drafts and estimates of the quantity of material needed for a building and the ordering of the same. Estimates as to the cost, labor and materials.

CONTRACTS AND SPECIFICATIONS

Competency. Legality of the agreement. Agreement. Consideration. Contracts under seal. Parol contracts. Assignments of contracts. Construction of the contract. Contracts required to be in writing. Discharge of contracts. Advertisement of proposals. Specifications. Classes of specifications. Clauses.

MATHEMATICS I

Arithmetic—The fundamental operations. Common fractions. Reduction of fractions to decimals and decimals to fractions. Decimals. Exercise in the use of the tables of weights and measures Problems on length, areas and volumes such as the student encounters in his daily work. Involution and evolution. Percentage. Ratio and proportion. Mensuration.

MATHEMETICS II

Algebra—Definitions of algebraic signs and terms. Simple equations. Substitution of numbers in formulas. Solution of problems related to the occupations of the students.

Geometry—Definition, straight line, angle, parallel lines, triangle, rectangle, circle. Properties of triangles, isosceles triangles, parallelograms and circles. Length of arcs and chords of a circle.

Trigonometry—Functions of the angles. Use of logarithms. Solution of right triangles and oblique triangles.

ENGLISH

The student should be taught to express clearly his thoughts and experiences. Particular attention should be paid to spelling, writing, neatness, simple sentences, punctuation, capitalization, and paragraphing. Short reports of the students' daily experiences should be written. Papers upon the various subjects related to the occupations of the students should be prepared by them and then presented for discussion. The important questions of the day should be discussed in the class by its members.

A Monument of Indiana Coal

Coal operators of the Indiana bituminous field united with state authorities in making the coal exhibit at the Terre Haute industrial exposition, a display really worth while.

A MONUMENT CONSTRUCTED OF INDIANA COAL, TERRE HAUTE, IND.

The Indiana operators erected a monument composed of coal from every operating shaft in the state. The base was 40 ft. square and the shaft 70 ft. high. The pillar was brilliantly lighted by electricity. Black cloth was hung on the sides of the shaft and on this was painted the names of the different beds of coal and of the counties in which the beds are located, with the average thickness of the seams.

A miniature but complete mine was also a part of the exposition and the mine-rescue exhibit attracted much attention. Terre Haute is the hub of the Indiana-Illinois bituminous region and the exposition was given under the auspices of the Terre Haute booster club of which the coal operators are prominent members. An exposition will probably be held each fall.

Interference with Anthracite Coal Production

An illustration of the interruptions which are seriously reducing the output of anthracite was presented at the colliery of the Price-Pancoast Coal Co., at Scranton. Joseph B. Dickson, president of the company, recently gave this account of the trouble:

"Twenty-seven men quit work a few days ago, stating that they wanted more money than they were receiving under the agreement between the mine workers and the operators. The force at the colliery numbers 1200 men, nearly all of whom were anxious to work, but these twenty-seven succeeded in closing the mine. They did not even state what amount they wanted. Later they withdrew this demand, and then insisted that we should limit the production of each miner to three mine cars of coal a day.

"A great many of our English-speaking miners are producing every day from four to six cars each. The local union officials stated that this caused dissatisfaction among the foreigners, and that if we would make a rule limiting one man's production to three cars a day they would be satisfied. This would simply reduce the earning power of the industrious and efficient class to that of the class which is less industrious, and, of course, we refused to make any such rule.

"The men decided to return to work after four days' idleness, but in that time they had caused a loss in production of eight or nine thousand tons. This is only one of the many recent stoppages of work at the anthracite mines. All of them together have reduced the output of coal by hundreds of thousands of tons. They are all in violation of the agreement between the operators and the mine workers, which is based on the award of the Strike Commission of 1902. According to that award all differences are to be adjusted by the Conciliation Board. In many of these recent cases, the Conciliation Board's orders that the men return to work have been ignored."

A First Aid Packet

Among other clever appliances having their origin in the Rocky Mountain region is the splint of W. V. Gage, a physician for the Colorado Fuel & Iron Co. The splint forms part of the dinner pail of every man entering the mine, can be detached from it without difficulty, but cannot be removed without injuring the pail, so it is sure to be ready when needed. Better yet, it contains the materials needed for bandaging in a completely airtight receptacle formed by the walls of the splint. The first-aid equipment is, therefore, on the spot, and not in some distant cabinet, and to obtain it a journey and a return journey does not have to be made.

Inquiries of General Interest

All Questions Must be Accompanied by Name and Address—Not for Publication

Two Examination Questions

There are two questions that have puzzled me, and I would like to ask for a full explanation, because these questions are often asked on mine-foremen examinations. The questions are as follows:

EXPLOSIVE LIMITS OF MARSH GAS

What are the lower and higher explosive limits of marsh gas? According to the answer given to the first question on p. 768, COAL AGE, Nov. 30, these limits are given as

Lower limit, 1 vol. gas; 13 vol. air;
Higher limit, 1 vol. gas; 5 vol. air.

I notice this is exactly the reverse of the lower and higher limits given for marsh gas in most textbooks, which give the lower limit as 1: 5, and the higher limit 1:13.

A FAN QUESTION

If a fan produces 100,000 cu.ft. of air per minute with a theoretical water gage of 0.81 in., what would be this fan's efficiency when it produces 256,728 cu.ft. per min. with a theoretical depression of 7.216 in. water gage?

THOMAS PAGE,
Kaylor, Penn. Mine Foreman.

Replying to the first question, in most mining textbooks the lower and higher explosive limits of marsh gas, as given, are reversed. This error dates back to an abstract of a paper on explosive gases read by Dr. Clowes before the Federated Mining Institute, which abstract appeared in a mining journal. The proportions of gas in explosive mixtures of gas and air, as given by Dr. Clowes, were expressed in *percentages* of gas in the mixture; but were quoted, in the abstract, as *volumes* of air to one of gas. Hence the error, since the smaller percentage of gas (lower limit) corresponded to the larger proportion of air.

The *lower* explosive limit of a mixture of any gas and air occurs when the smallest percentage of the gas is present that renders the mixture explosive. From this point, the explosiveness of the mixture increases with the increase of gas until it reaches a maximum; and beyond that point, as the gas is still further increased, the explosiveness of the mixture decreases until a point is reached where the gas is present in such large proportion that the mixture ceases to be explosive. This is called the *higher* explosive limit. The correct proportions of gas and air are those given in answer to the examination question to which our correspondent has referred; namely, lower explosive limit, 1:13; higher explosive limit, 1:5. The percentage of gas in the firedamp mixture is, therefore, lower limit, 7.14 per cent.; higher limit, 16.67 per cent.

The statement of the second question is not clear as to its meaning. We will assume that the question intends to state that the fan is capable of producing 100,000 cu.ft. per min. against a water gage of 0.81 in.; and it is desired to ascertain what the relative efficiency of this fan would be if it is found to produce 256,728 cu.ft. per min., against an increased water gage of 7.216 in.

Since the quantity of air in circulation varies as the square root of the water gage, the increased water gage, in this case, should give a circulation of

$$\sqrt{\frac{7.216}{0.81}} \times 100{,}000 = 298{,}500 \text{ cu.ft. per min.}$$

But since the fan is only producing 256,728 cu.ft. per min., against this water gage, its relative efficiency is

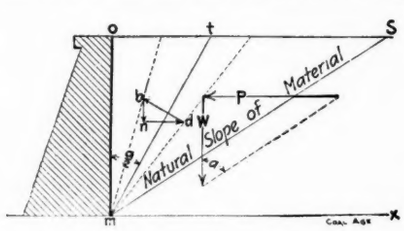
$$\frac{256{,}728}{298{,}500} \times 100 = 86 \text{ per cent., nearly}$$

Pressure on Retaining Wall

I would like to draw attention to the formula given in Trautwine's Civil Engineers' Pocket Book, p. 607, edition 1911. I refer to the formula No. 1, which is as follows:

$$\text{Perpendicular pressure} = \frac{\text{wt. of triangle } omt \times ot}{\text{vertical depth } om}$$

Referring to the accompanying figure, *om* is the vertical back of the retaining



PRESSURE OF MATERIAL BEHIND RETAINING WALL

wall; *sm* is the natural slope of the material. Then taking the weight of earth in the triangle *omt* as producing the maximum pressure, it would seem that this weight, acting vertically, is opposed by two pressures, one perpendicular to the back face of the retaining wall and the other perpendicular to the natural slope. If this is true, the small triangle *bnd* represents the triangle of forces; *bn* being the vertical weight resisted by *nd* and *db* perpendicular, respectively, to the back face of the retaining wall and the assumed natural slope of the earth. Then,

$$nd = \frac{bn}{\tan ndb}$$

but the angle *ndb* is equal to the angle *omt* and *tan omt* equals $\frac{ot}{om}$, which gives, finally

$$\text{perpendicular pressure} = \frac{\text{wt. of triangle } omt \times om}{ot}$$

Since this formula differs from that given by Trautwine, I would like to know how the latter is obtained.

H. V. S.

Cleveland, Ohio.

In the case of a retaining wall, if *ms*, in the figure, is the natural slope of the material, the triangle *oms* represents the weight supported by the retaining wall and resting on the natural slope *ms*. In this case, the solution is analogous to a wedge *xms*, lifting the weight represented by the triangle *oms*. It would be contrary to the conditions of the problem to regard *oms* as the wedge. The question is, what horizontal pressure due to the incline *ms will support the weight oms*? Calling the horizontal pressure *P;* the triangular weight *oms*, *W;* and the angle *oms*, *a*,

$$P = W \tan a$$

As stated in Trautwine, it has been found by experiment that the maximum pressure behind a retaining wall is that due to the weight of the triangle *omt*, in which the angle *omt* is one-half the angle *oms*. Therefore, accepting this hypothesis, the formula for the maximum pressure behind a retaining wall is

$$P = \text{wt. of triangle } omt \times \tan omt$$

$$P = \frac{\text{wt. of triangle } omt \times ot}{\text{vert. depth } om}$$

which is the formula given by Trautwine.

The pressure on the back face of the retaining wall is not evenly distributed, but is *nil* at the top and increases with the depth, being greatest at the bottom of the wall. The mean effective or average pressure exerted against the wall at the back, and acting horizontally in this case, is one-third the vertical height of the wall above the bottom. This pressure acts to overturn the wall about its outer base and is resisted by the weight of the wall acting vertically through its center by gravity.

Examination Questions

Selected from State Examinations, or Suggested by Correspondents

Examination Questions

(Answered by request)

Ques.—If 20,000 cu.ft. of air are passing (per minute) in a circular airway 12 ft. in diameter, what quantity of air will the same pressure pass in a similar airway 6 ft. in diameter?

Ans.—In circular airways, for the same pressure, the square of the quantity varies as the fifth power of the diameter of the airway. In other words, the square of the quantity ratio is equal to the fifth power of the diameter ratio. Calling the required quantity of air x

$$\left(\frac{x}{20{,}000}\right)^2 = \left(\frac{6}{12}\right)^5 = \left(\frac{1}{2}\right)^5 = \frac{1}{32}$$

$$x = \frac{20{,}000}{\sqrt{32}} = 3535 \text{ cu.ft. per min.}$$

Ques.—If a volume of 30,000 cu.ft. of air is entering a downcast shaft 14 ft. in diameter (each minute), at a temperature of 60 deg. F., what must be the diameter of the upcast shaft to pass this air, at the same velocity, the temperature of the upcast being 90 deg. F.?

Ans.—Disregarding the effect due to the decrease of ventilating pressure in the upcast shaft, the volume of air varies directly as the absolute temperature. In other words, the volume ratio is equal to the absolute-temperature ratio, which, in this case, is

$$\frac{460 + 90}{460 + 60} = \frac{550}{520} = \frac{55}{52}$$

In order to produce the same velocity in both shafts, the sectional area of the shafts must vary as the air volume; or the area ratio must be equal to the volume ratio. But, since the diameter of a circular shaft varies as the square root of the area, the diameter ratio is equal to the square root of the area ratio or, in this case, the volume ratio. Therefore, calling the required diameter of the upcast shaft x,

$$\frac{x}{14} = \sqrt{\frac{55}{52}} = 1.028$$

$$x = 14 \times 1.028 = 14.4 \text{ ft.}$$

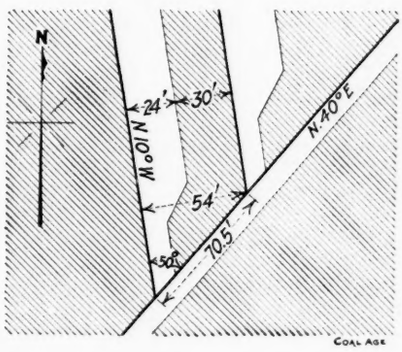
Ques.—If a volume of 1200 cu.ft. of marsh gas is mixed with pure air, in such proportion that when exploded all the carbon in the marsh gas combines with the oxygen in the air, what volume of carbonic-acid gas (carbon dioxide) will result, measured at the same pressure and temperature?

Ans.—Assuming that the volume of air is sufficient for the complete combustion of the gas, so that all of the carbon of the marsh gas is burned to carbon dioxide (CO_2), the volume of carbon dioxide formed will be the same as the volume of marsh gas burned, measured at the same temperature and pressure. The reaction is represented approximately by the following equation:

$$CH_4 + 2\ O_2 = CO_2 + 2\ H_2O.$$

The coefficient preceding the symbol for each gas or vapor, indicates the relative volume; thus 1 volume CH_4, combines with 2 volumes O_2 to form 1 volume CO_2 and 2 volumes H_2O. The H_2O formed exists as water vapor or steam until condensed by a fall of temperature, later. The volume of carbon dioxide formed, in this case, is 1200 cubic feet.

Ques.—An entry is driven (north) 40 deg. east, and the rooms are turned north 10 deg. west. If the pillars are 30 ft. wide and the rooms 24 ft. wide, what is the distance between room centers measured on the entry?



TO CALCULATE DISTANCE BETWEEN ROOM CENTERS, MEASURED ON ENTRY

Ans.—Referring to the accompanying figure, the rooms make an angle of 10 + 40 = 50 deg. with the entry. The distance between room centers or the distance from straight rib to straight rib, measured square across the rooms, is 24 + 30 = 54 ft. The distance between room centers or the corresponding distance from straight rib to straight rib, measured on the entry, is then

$$\frac{54}{\sin 50^\circ} = \frac{54}{0.766} = 70.5 \text{ ft.}$$

Ques.—If a volume of air of 35,000 cu.ft. per min. is passing in an airway 5.5x7.5 ft., what is the velocity of the air current?

Ans.—The area of this airway is 5.5 × 7.5 = 41.25 sq.ft. The velocity of the air current is then

$$v = \frac{Q}{a} = \frac{35{,}000}{41.25} = 848.48 \text{ ft. per min.}$$

$$v = \frac{848.48}{60} = 14.14 \text{ ft. per sec.}$$

Ques.—What load will break a white-oak timber 8x12 in. and 15 ft. between supports, if the load is equally distributed along the length.

Ans.—First, find the section modulus of the timber, by multiplying the square of its depth by its width and dividing by the length of clear span or distance between supports, all in inches. Thus,

$$\frac{8 \times 12^2}{15 \times 12} = 6.4$$

Multiply this result by the ultimate fiber stress of the material (white oak, 10,000 lb. per sq.in.); thus,

$$10{,}000 \times 6.4 = 64{,}000 \text{ lb.}$$

For a beam uniformly loaded and supported at both ends, the breaking load is $\frac{4}{3}$ of this amount; or, in this case,

$$\frac{4}{3} \times 64{,}000 = 85{,}333 \text{ lb. } (42.67 \text{ tons})$$

Ques.—Is it possible for a shot to hangfire, in electric blasting in mines; and, if so, state the possible cause?

Ans.—Yes; this has happened many times in firing blasts by electricity. The most frequent cause for such an occurrence is probably the inability of the cap or detonator to explode the charge, owing to lack of strength. The explosion of the cap, however, though failing to detonate the charge, may often start an ignition that later generates enough heat to cause the explosion. The same effect may result from an injured or defective condition of the exploder.

Ques.—Into what two general classes are all electrical machines commonly divided?

Ans.—Electrical machines of all descriptions are classed according to the kind of current they employ, as direct- or alternating-current machines.

Ques.—What current is commonly employed for operating power machines in coal mining, and how is it possible to use alternating current to transmit power into the mines when the machines to be operated require direct current?

Ans.—With few exceptions, mining machines, electrically driven, use direct current. When alternating current is used for transmission, it is necessary to install a transformer, in the mine, near the point where the power is to be used.

Coal and Coke News

From Our Own Representatives in Various Important Mining Centers

Washington, D. C.

Considerable surprise was expressed here at the failure of the supreme court to hand down decisions in the so called "hard-coal cases" on Monday, Dec. 9, and the expectation in many quarters now is that these cases will be postponed until after the holidays. The prolonged delay has, as usual, given rise to stories of differences between the judges of the Supreme bench. These stories may or may not be correct. There is, of course, no positive evidence one way or the other that would indicate definitely what was the probability in the case. The facts as to such a difference, if one existed, would be far from likely to get into the hands of the public.

Meantime it has become evident, since the opening of Congress, that there is less probability than had been hoped of an early report on the investigation into strike conditions in the hard-coal region that had been undertaken by the Bureau of Labor at the instance of Congress. The statement is now made that no final report will be likely to be turned in, in time for any action that might be deemed wise at this session, but that instead it will be necessary to await the special session. On the other hand, it is possible that the facts already collected will be called for by Congress at an early date whether complete or not.

Louisville, Ky.

The situation in the western part of the state with reference to the furnishing of cars to the mines, especially those in Hopkins County, is being generously aired. Before the full railroad commission, at Frankfort appeared representatives of the miners and mining operations of Hopkins County. The Illinois Central R.R. Co. was charged with discrimination in the furnishing of cars to the Graham, Central City and Martwick mines, of Muhlenberg County, to the practical exclusion of the Echols, McHenry, Rockport, Williams, Broadway, Render and Taylor mines, of Ohio County.

Superintendent Egan, of the Illinois Central, explained to the commissioners that the alleged favored mines had a contract to sell their entire output to the railroad for its own use. Representatives of the miners complained that the latter are starving because they do not get enough work to provide them with necessities.

It was agreed at the beginning of the hearing that the railroad commission has no power to force the railroad companies to furnish cars. R. B. Fletcher, in presenting the case for the railroad company, said the conditions existing in western Kentucky are not unlike those existing in other parts of the country, coal cars being more in demand in some sections than in others, the result of local conditions. He said his company had 23,000 coal cars, to which it added 500 built for it and 785 purchased this year.

Wilkes-Barre, Penn.

An unusual suit is that which caused the arrest of General Manager John G. Hayes, of the People's Coal Co., of Scranton, on a warrant charging him with reckless mining, sworn out by Director of Public Safety W. G. O'Malley. This is the first action instituted to test the police powers of the state, under which it is hoped to control the mine-cave evil in the anthracite regions.

Specifically, Hayes is charged with the responsibility for a cave which on Sept. 16 wrecked a number of buildings in West Scranton, and which at the same time ruined several city streets in the same vicinity. While the fine in the event of his being found guilty is only $100, yet it is the intention of the authorities of Scranton to push the case to the utmost, in order to determine the right of coal companies to mine coal from under city streets.

Employees' Insurance Movement

There is now a movement among the miners employed by the Lehigh Valley Coal Co. to establish an insurance feature around the mines that will act as a protection to widows and orphans of men killed in the mines. Petitions are being circulated among the employees, and when sufficient names are secured the paper will be presented to the company authorizing it to deduct so much from the earnings of the men and pay the total amount to the heirs of the deceased.

Under the plan proposed every miner earning over a certain amount would contribute fifty cents for every death, while the lowest paid class of labor would give twenty-five cents. The men have requested that the company contribute a proportionate amount.

In the event that the plan is adopted, the men agree to work on the day that an employee is being buried. In other sections where the plan is employed it is customary to give a half day's pay to the dependents of an employee who is killed, and the company contributes a like amount.

Such a plan is in force under the L., C. & N. Co. in the Panther Creek Valley, and the aggregate in most cases is over $1000. Whether the L. V. C. Co. will agree to a like plan is yet to be determined.

Firebosses in the Hazleton region, who joined with the mine foremen in asking that their wages be increased, have just been notified that hereafter they will not be required to work after 1 o'clock in the afternoon.

United Mine Workers vs. United Brotherhood of Carpenters

At a meeting recently held in Wilkes-Barre between representatives of the United Mine Workers of America and of the United Brotherhood of Carpenters and Joiners, an agreement was reached which settles for the time being the question of which organization the carpenters employed about the mines shall be affiliated with. The agreement, in substance, is that the men employed in the shafts and directly in the mines shall join the Mine Workers, and the men employed in erecting breakers and other buildings on the surface about the collieries shall join the carpenters' union. This is to be in effect until the question is placed before the national executive boards for their ratification.

Pennsylvania

Anthracite

Hazleton—The 400 hands employed at the Black Ridge colliery struck, Dec. 4, because of the discharge of one of their number.

Scranton—Considerable damage is resulting from a settling of earth caused by the mine working of No. 4 shaft of the Erie R.R. Co. The Old White church, which is located on Wheeler Ave., near the city line, is in a precarious condition and the residence of August Hample, next to the church, is about to topple.

Wilkes-Barre—At the miner's conciliation board meeting, Dec. 2, a resolution was adopted sustaining the grievances of the Lehigh Valley Coal Co. against the mine committee at the Hazleton shaft colliery, for inciting the men to strike because a machinist had refused to join the union.

Mine caves have been frightening the residents in that section of Wilkes-Barre which is undermined by the workings of the old Smith colliery. The plant is now controlled by the Wilkes-Barre An-

thracite Co. Officials claim that they cannot predict the outcome because the disturbance is in a part of the mine which has been abandoned for several years.

The Anthracite Mine Code Commission met, Dec. 3, in the Coal Exchange Building, to hear the report of the subcommittee appointed to consider changes of the anthracite mining laws. The contemplated changes are in the mine inspector's law, the mine foremen's examining board and the reduction of the present age limit for the employment of boys in the mines.

BITUMINOUS

South Fork—An additional class of six men has started the rescue work of the U. S. Bureau of Mines here. All these men are in the employ of the Argyle Coal Co., which is displaying quite an interest in this work.

Other classes from other mining companies in South Fork and vicinity will probably start to take the rescue training in the near future. First-aid teams are being organized.

Carnegie—The Mansfield mine of the Pittsburg Coal Co. has been shut down since Nov. 30. Five hundred miners quit work and have not yet returned.

Waynesburg—Coal in Clarksville is worth $300 an acre, according to the returns made by assessor J. C. Shull, Nov. 29. This is the highest assessment placed on coal so far. Coal in the last assessment was placed at $115 an acre.

Kentucky

Louisville—Relief is being sought for the Western Kentucky coal field by the filing before the Interstate Commerce Commission at Washington by the Williams Coal Co. and the Taylor Coal Co. of a petition against the Illinois Central, alleging discrimination in the furnishing of cars. Immediate action is urgently prayed for, in view of existing conditions among the miners and in the coal supply generally, which are declared to constitute an emergency.

The Interstate Commerce Commission has just held that the rates on cannel coal from Kentucky to destinations on eighty-two Central Western railways were excessive and discriminatory, in that they exceed by more than forty cents a ton the cannel-coal rates from the Kanawha district to the same points. The Commission held, however, that higher rates on cannel coal than on bituminous were not unlawful.

Illinois

Du Quoin—On Dec. 5 a portion of the tipple, with the boiler and engine house and electrical machinery at the Brilliant Coal Co.'s plant, was destroyed by fire, with an approximate loss of $5000.

Indiana

Evansville—The U. S. Bureau of Mines is considering the erection at Evansville of one of the six additional permanent mine rescue stations to be established by the government, that point having been recommended in a report before Congress on the subject.

Epworth—The collapse of one of the walls of the shaft at the Staser Epperson coal mine, stopped work for several days.

Iowa

Sayler—The plant of Sayler mine No. 2 burned, with loss of $100,000, throwing 400 men out of work.

Ohio

Bridgeport—Deputy mine inspectors of the fifth Ohio district visited this city two weeks ago to look into the fire which was started in the McComas mine and take measures for putting it out.

The mine is but a short distance from the working of the Lorain Coal & Dock Co. and everything possible is being done to prevent the fire from reaching there.

Canton—For the second time within the month incendiaries caused a fire at the mine of the Sonnhalter Coal Co., two miles north of Canton, Nov. 29. The office was completely destroyed. On Nov. 5, the mine buildings, including the boiler house, barn and tipple were also burned by a fire of incendiary origin. A few nights previously, 21 sticks of dynamite were placed about the buildings with fuses attached, which were laid on top of the boilers, the supposition of the firebugs being that heat from them would ignite the fuse. The mine is one of the largest in this vicinity and the company does a prosperous business in this city, where all the coal is marketed.

Texas

Austin—State Purchasing Agent J. R. Elliott has just completed arrangements with the University of Texas whereby a series of analyses will be made of the coal, fuel oils and other oils furnished the state institutions.

Oklahoma

McAlester—The tipple of the Pierce Coal Co.'s Mine, near Carbon, was destroyed, Dec. 4, by a fire which started in a stove in the office. Four railroad cars on the track at the mine were lost at the same time. The loss is estimated between $4000 and $5000.

Foreign News

ALASKA

The United States coal-mining expedition has reached Chilkat from the Bering River coal fields. A naval test will be made with the 885 tons of coal which have been mined. All the coal was taken from Trout Creek and the Cunningham Group. The expedition started for Seattle, Dec. 4.

Personals

Daniel B. Wentz, of Philadelphia, Penn., president of the Stonega Coke & Coal Co., is spending ten days at the company's Virginia headquarters, at Big Stone Gap, Va.

Drury McN. Phillips, of Austin, Texas, has been appointed engineer for the Consumers Lignite Co., Hoyt, Wood County, Texas. This company is said to be the largest producer of lignite in the United States.

M. J. Healey, who operates a colliery near Plains, has brought suit against the Wilkes-Barre Colliery Co., one of the new acquisitions of Madeira, Hill & Co., claiming common ownership in certain of the tracts. A long litigation may be the result.

The Monongahela River Coal & Coke Co., of Pittsburgh, has appointed as its local manager at Louisville, Griffith W. Shaw, of Pittsburgh, succeeding Capt. M. J. Seebolt. Mr. Shaw has been associated with the company for 11 years, ever since its organization, and has been working in the traffic end of the business much of the time. He has taken charge of the Louisville office.

Obituary

David Eccles, president of the Wyoming Coal Co., Union Fuel Co., and Lion Coal Co., dropped dead on the street in Salt Lake City, Dec. 5. Mr. Eccles was heavily interested in many enterprises in the intermountain territory.

G. B. Findley, vice-president and general manager of the West Virginia, Pittsburgh Coal Co., met his death in a railroad accident near Philadelphia, Nov. 27. Mr. Findley is survived by a wife and three daughters, and was one of the best known coal men in the Pittsburgh district.

Erratum

In our issue of Nov. 23, under the heading of Construction News, Helena, Ala., it was stated that T. F. Wear was superintendent and G. W. Postell construction engineer on some construction work at Helena, Ala. This should have read that G. W. Postell was superintendent and T. F. Ware master mechanic.

Construction News

Peoria, Ill.—It is announced that a coal-mining plant, to cost $90,000, will be put up on the Marshall P. Smith farm, next Spring.

East Liverpool, Ohio—The Y. & O. R.R. repair gang has completed a 200-ft. siding to the Rock Camp Coal Co.'s mine on the Croft farm near West Point.

Cloete, Mex.—Cia. Carbonifera del Sabinas, South America, are digging foundations for 160 new coke ovens, and

they propose to build 160 more next year.

Eagle Pass, Tex.—Roy Hodges, manager of the International Coal Co., is planning on installing a new coal tipple, either of steel or wood, capable of handling 500 tons per day.

Barnesboro, Penn.—Greenwich Coal Co. will in the near future have about 30 of their one-story houses torn down at Starford and moved to Colver on the border line of Cambria and Indiana Counties. The coal operations of this company at Starford have been pretty well worked out.

Columbus, Ohio—The Hocking Valley Products Co., of Columbus, Ohio, is erecting a number of houses for its employees to be built out of the brick manufactured by the company, at the seat of its operations in Hocking County. The houses will be sold to the employees on a rental basis.

Christopher, Ill.—The No. 6 bed, which was struck in the sinking of a new shaft east of here, was found to be 12 ft. in thickness. The top works of this plant will be rushed forward now, and everything about it will be electrical. No mules will be employed about the place, all hauling being done by electric motors.

Jenkins, Ky.—The Consolidation Coal Co. has let to the Nicola Building Co., of Pittsburgh, the contract for the construction of 200 ten-room houses in Jenkins, and is also putting up as rapidly as possible several hundred new houses in McRoberts. The work in the latter town will be completed in about 60 days, with the exception of the permanent Y. M. C. A. building, the store, a hospital, and a church and school building. A large amount of street grading and other general improvement work will be done in the two towns.

Roanoke, Va.—The Appalachian Power Co. has recently completed and placed in operation on the New River, in Virginia, two power plants which develop hydroelectric energy totaling 29,000 hp. Lines have been built from these plants to Bluefield and Coalwood, W. Va., and Saltville and Roanoke, Va., and the power will be immediately utilized in the operation of the rich mineral districts in the vicinity of those points, which include Pocahontas coal, iron, zinc, copper, salt, gypsum, glass sand, and clay. The company has contracted with the Pocahontas Consolidated Collieries Company for the use of the latter's 7500 hp. steam turbine plant at Switchback, which will be employed as a reserve and to supplement power from the hydraulic developments.

New Incorporations

Danville, Ky.—Abigail Mining Co.; capital stock, $40,000.

Nashville, Tenn.—Carroll Coal Co., Shelby County; capital stock, $25,000.

Jefferson City, Mo.—Bates Coal Mining & Mercantile Co., Rich Hill; capital, $2500.

Brilliant, Ala.—American Coöperative Coal Mining Co.; capital stock, $200,000. To develop coal lands.

Preston, W. Va.—Preston Fuel Co.; Capital, $300,000, of which $500 has been subscribed and $55 paid in.

Coal Run, Ohio—The Sycamore Coal Co. has been incorporated by M. M. Rese, A. E. Roberts, J. F. Keyhoe and S. F. Adair.

Morganfield, Ky.—The Hercules Coal Co., an operating concern at Morganfield, Ky., has changed its name to the Beddell Coal Co.

Lynndale, Ky.—The Jellico Gas Coal Co., capitalized at $6000, has been organized by W. H. Soper, A. S. Soper and L. R. Soper.

Magnolia, Ohio—The Magnolia Coal Co., $5000; John E. Rice, John J. Williams, Emmet C. Close, D. C. Vankirk, L. H. Echsideger.

Philadelphia, Penn.—The Hale Coal Co. has been incorporated with a capital of $10,000, and will enter the coal trade at Huntsdale, Penn.

Greenwood, Ark.—The Greenwood Semi-Anthracite Coal Co. has been organized by W. A. Butterfield, president, with a capital stock of $10,000.

Oskaloosa, Iowa—McNeill Brothers; capital stock, $37,500. To buy, lease, and operate coal mines, and to purchase any real estate and hold the same for mining purposes, etc.

Philadelphia, Penn.—Consumers' Coal Co., Camden, N. J. Deal in coal, coke, wood, fuel, oil, etc. Capital, $50,000. Incorporators, J. M. Russel, A. M. and E. M. Garrison, Camden, N. J.

Cleveland, Ohio—The Netta Coal Co. has been incorporated with a capital of $50,000. The incorporators are Howard A. Couse, T. Carleton, Charles A. Morris, Owen N. Wilcox, and R. G. Curren.

Corbin, Ky.—The Corbin-Jellico Fuel Co. has been incorporated with a capital stock of $10,000; incorporators are Oscar W. Black, Lee B. McHargue and George G. Brock. The company will begin operations at once.

Parkersburg, W. Va.—Penn Erie Coal Co., to develop coal lands in Jefferson County, Ohio. Capital, $10,000. Incorporators, E. M. Gilkeson, A. H. Kunst, H. P. Camden, Annie Aiken, A. C. Finley, Parkersburg, W. Va.

Toledo, Ohio—The Oakland Coal Co., of Toledo, Ohio, has been incorporated with a capital stock of $10,000, to deal in coal and coke. The incorporators are L. Jay Gifford, Thomas H. Gifford, Arline Sullivan, Frank J. Reis and W. T. S. O'Hara.

Connellsville, Penn.—Articles of incorporation were filed here at the State Department today for the Hyattsville Milling & Manufacturing Co., of Baltimore. H. M. Fowler and R. R. Rudel, of Washington, D. C. The capital stock is $50,000.

Akron, Ohio—The Builders' Supply Co., of Akron, Ohio, has been incorporated with a capital stock of $10,000, to deal in coal and builders' supplies. The incorporators are W. Oliver Wise, E. V. Smith, A. J. Rowley, R. H. Nesbitt and George T. Smith.

Huntington, W. Va.—Preston Fuel Co., Philadelphia, Penn.; to develop coal, oil and gas lands in Preston County, W. Va. Authorized capital, $300,000. Incorporators are Buckner Clay, George E. Price, R. M. Price, A. C. Collins and R. S. Spillman, all of Charleston.

Pittsburgh, Penn.—Belle Vernon Coke Co., of Pittsburgh, has been chartered. $40,000. Jno. H. Hillman, Jr., of Pittsburgh; Holmes A. Davis, of Wilkinsburg; Wilmer H. Willkey and W. W. Parshall, of Uniontown. The company will develop a tract of coal land near Belle Vernon in Fayette County. Also the same company of men, likely under another name will operate a coal and coke plant near Brownsville.

Baltimore, Md.—The Cumberland Co., a new Maryland corporation, has been formed to take over the properties of the old Cumberland Basin Coal Co., which went into the hands of receivers some months ago. The new corporation will issue $700,000 of new first preferred, $412,225 second preferred and $647,500 of common stock, which securities will be exchanged for securities of the Cumberland Basin Coal Co.

Georgetown, Ky.—The Henry Coke & Coal Co. has been organized with a capital stock of $200,000, and has already acquired title to 44,000 acres of coal land in Perry County, near Hazard, Ky. It will at once begin development work. Among the prominent stockholders are T. J. Davis, cashier of the First National Bank, Cincinnati, Ohio; A. S. Rice, president of the Southern National Bank, Louisville, Ky., and others.

Toronto, Can.—The Pacific Coast Collieries Co., Ltd., has been organized with an authorized capital of $5,000,000 ($3,500,000 common and $1,500,000 preferred), and a bond issue of $3,500,000. It is to take over the Pacific Coast Coal Mines, Ltd., one of the largest operating coal properties on Vancouver Island, owning its own docks, railways, etc., and at the present time shipping 600 tons a day. It is said that this output will be increased to 1500 tons a day, in 1913 and 2500 tons a day in 1914. James Carruthers of Montreal is president of the new company. Edmund Bristol, Toronto, is one director.

Industrial News

Pittsburgh, Penn.—Orders have been placed by the Pennsylvania R.R. Co. for 1500 gondola cars and 1500 coke cars.

Connellsville, Penn.—The Altoona Coke Co. will fire 100 ovens within the present week. They have been idle for two years.

Barbourville, Ky.—W. C. Black has taken over the operations of the Tunnel Jellico Coal Co., at Emanuel, in Knox County, Ky.

Greenwood, Ky.—The Whitley Supply Co., of Whitley City, Ky., W. J. Geary, proprietor, will open a coal mine on 19,000 acres of land owned by it.

Connellsville, Penn.—The Reading's anthracite tonnage for November will approximate 1,200,000 tons. This compares with 1,288,457 tons for November, 1911.

Waynesburg, Penn.—Amos and John Horner, of Cumberland Township, have sold the coal interest in the home farm to Uniontown parties for $[illegible] per acre.

Sydney, N. S.—The output of the Dominion Coal Co. for November was 400,000 tons. It is stated that the company will have mined 4,500,000 tons by the end of the year.

Waynesburg, Penn.—The Dillworth coal plant and its property at Rice's Landing was offered at sheriff's sale, Nov. 30, and bid to $17,000. Sale was adjourned until Dec. 4.

Mt. Pleasant, Penn.—The Keystone Coal & Coke Co., with headquarters in Greensburg, Penn., contemplates reopening the mine near Hunker station, which has been closed several years.

Elkhart, Ind.—B. C. Godfrey & Son have purchased the J. P. Sanders Coal Co. This puts the Godfrey company among the large coal companies of Indiana. Consideration, $15,000.

Bremond, Tex.—It is rumored that S. M. Peters is organizing a company to develop the coal lands near here.

expected that a railroad will be built from this city to the coal deposits.

Nicktown, Penn.—An 800-acre tract of coal land that the Blubaker Coal Co. has had under option here for several months has been purchased by that company, and it is expected that new openings will be made soon.

Eskdale, W. Va.—The National Bituminous Coal & Coke Co. has taken over the property of the Hooly & Stephensen Coal & Coke Co., consisting of 1200 acres of coal land and two mines in the Kanawha region.

Clarksburg, Penn.—The Rochester & Pittsburg Coal & Iron Co. has secured an option of about 3000 acres of coal just east of Clarksburg, this county, from the New York Central R.R., who purchased the tract less than two years ago.

New Waterford, Ohio—Operators have struck a rich coal seam half a mile from the center of this town.

Eastern Ohio capitalists control the rights and will spend $50,000 developing mines. Five hundred men will be employed.

Bernice, Penn.—A seam of coal 5 ft. thick has been discovered here under the old Bernice vein, which has been mined out. The Connell Anthracite Coal Co. has sunk two drill holes on the side near the old depot. At a depth of 80 ft. the new bed was found.

Johnstown, Penn.—James & Fulton have leased from the Emmerling Estate, four acres of coal in the Walnut Grove vicinity. It is the intention immediately to open a mine, supplying house coal to the retail trade.

Clinton, Ind.—The Miami Coal Co. has taken options on about 1000 acres of coal land near the state line, west of Clinton. Drillers are at work and it is understood that one or more mines will be opened on the Chicago, Terre Haute & Southeastern R.R.

Fairmont, W. Va.—The Consolidation Coal Co. will close the year with a production of at least 1,100,000 tons in excess of the output in 1911. Next to the Pittsburg Coal Co. the Consolidation company is the largest soft-coal producer in the world.

Joliet, Ill.—The Wilmington Coal Mining & Manufacturing Co. is making extensive improvements around the mine. A new engine has been installed to haul the dirt car up the elevated dump. This engine replaces an old one which has been in use 30 years.

Atlanta, Ga.—The H. W. Johns-Manville Co. announces the appointment of C. S. Berry as manager of their Atlanta office, at 31½ S. Broad St. To facilitate delivery in the South, a stock of roofings, packings, pipe coverings, etc., will be carried at this address.

E. Palestine, Ohio—The Dunn & Kirk Co., who have been prospecting in and near New Waterford for a profitable coal vein, struck a bed about a half mile west of the village that measures 3 ft. 3 in. thick. A shaft will be sunk and operations commenced at once.

Providence, Ky.—The Clear Creek Coal Co., of Providence, Ky., which has attained a daily output of 1200 tons on the development of its holdings of 490 acres, plans to install next year either a 200-kw. generator and mining machines or an air plant. V. Ruckman is president.

Connellsville, Penn.—The Public Service Commission, Second District of New York, has authorized the Empire Coke Co. to lease to the Semet-Solvay company its byproduct coke-oven plant at Waterloo for a term of five years, with an option for a further term of five years.

Ebensburg, Penn.—A new company, which has leased 500 acres of the holdings of the Blubaker Coal Co. in the neighborhood of Spangler will shortly let a contract for the sinking of two shafts, each about 100 ft. in depth, and that work on the job is to be started about Jan. 1.

Eldridge, Ill.—Options on about 4000 acres of coal land are being taken up by representatives of the American Steel & Wire Co. for purchase on Jan. 1, according to a rumor. Contracting rates are from $25 to $45 an acre, and the option includes an agreement for a royalty of 8c. a barrel on any oil found.

Shanksville, Penn.—Owners of coal lands in Shade, Quemahoning and Stonycreek Townships have received word that options taken on their coal will be lifted at the price offered, $50 per acre. The options were taken by L. C. Lambert and Capt. W. H. Sanner, but whom they represented has been kept a secret.

Monterey, Mex.—The Monterey Steel plant, a $10,000,000 concern, has been forced to close down on account of lack of coal and inability to get coal to the city from its mines near Laredo, Tamaulipas.

Rebels have burned the bridges and the coal mines belonging to the steel company.

Chicago, Ill.—During 1912 the Canadian Pacific has ordered $48,000,000 worth of rolling stock. This is said to be double that ordered by any other railroad in North America during the same period. Part of the orders have already been delivered and the remainder will be furnished as quickly as the shops can turn out the product.

Rockdale, Tex.—W. M. Wells, owner of the International Coal & Brick Co., has sold the property of the company, consisting of 400 acres of coal lands and two mines, both in operation. Consideration, $100,000. The mines sold are on the International & Great Northern Ry., and are known as the Big Square and the International.

Hazard, Ky.—A number of coal-mining concerns are making active preparations to begin the mining and shipping of coal. Among them are the Raccoon Coal Co., of which S. A. D. Jones and W. N. Jones are at the head; the Perry Co. Coal Mining Co. and the Hazard Coal Co. Within a few months everything will be in readiness for shipping coal from Hazard.

Pineville, Ky.—The Continental Coal Corporation, near Pineville, Ky., is putting into operation its 200 coke ovens in the Straight Creek district, which have been idle for several years past. Repairs are being made as fast as possible, and 33 ovens have already been fired. The company also intends putting into operation the 100 ovens at Wallsend, Ky.

Paducah, Ky.—Press dispatches are to the effect that the car department of the Illinois Central at that place is being worked to its fullest capacity in order to get out cars under construction for the purpose of relieving the mine shortage, to some extent. It is also stated that the yards contain several hundred "bad order" cars, whose prompt repair might relieve the situation appreciably.

Edwardsville, Mo.—The greater portion of the remaining coal rights in the southern part of Madison County are being bought up for parties whose identities are kept secret. Options on about 7000 acres are said to be deliverable Feb. 1, 1913. It is understood that 8000 to 10,000 acres are being sought and that the intention is to put down one of the largest mines in southern Illinois. Twenty-five dollars per acre for the underlying coal is being given.

Hopkinsville, Ky.—The intention of the Tennessee Central R.R. to extend its lines from their present Kentucky terminal at Hopkinsville to the western Kentucky coal fields was declared recently before the Kentucky Railroad Commission by Industrial Agent Rutledge Smith, of Cookeville, Tenn. He stated that two surveys have already been made with a view to determining the most feasible route, and that the line will probably be constructed through Providence and Sturgis, Ky.

Chattanooga, Tenn.—C. E. Buck, who acted as receiver for the Chattanooga Iron & Coal Co. during foreclosure proceedings brought by a committee of the bondholders, who bought in the company's properties at the judicial sale, will act as manager for the new owners until a new company is organized, which will be within a month. It is reported that the purchase price was $500,000. The company's properties included timber and coal lands, iron mines, limestone quarries and an iron furnace.

Harlan, Ky.—The Kentennia Corporation, a $9,000,000 organization, conducted by New York and Boston capitalists, and headed by C. P. Peria, of New York, is showing indications of an intention to proceed with the development of its eastern Kentucky properties on a large scale, as outlined when the company first became active in acquiring acreage in that field more than a year and a half ago. Holding about 60,000 acres in the Harlan and adjoining fields, the company is now planning to begin operations at a number of different points, constructing the necessary spurs and branch lines to enable it to ship over the Wasioto & Black Mountain.

Stoyestown, Penn.—The most important coal deal made in Somerset County since 1902, in which at least the sum of $250,000 will change hands, has been consummated. The tract comprises about 5000 acres in Shade, Stonycreek and Quemahoning Townships, along Stonycreek and Overrun. Eastern capitalists said to be closely allied to the P. R.R. have had this tract optioned and have given the owners notice to have deeds made. C. E. Dickey, of Johnstown, was seen looking over this field last week, and will make a report on the coal today. The land embraced is among the best located coal land in Somerset County, but the coal varies in quality.

Marietta, Ohio—Some idea of the substantial improvement that has been made in the Marietta, Columbus & Cleveland Ry. was recently afforded to a party of local directors of the road. One of the most interesting spots visited by the party was a great coal mine at Big Run, which the Job Coal Co. is preparing to open, with Wm. Job, of Marietta, in charge. Near Big Run he has leased 2800 acres of coal land, and his company is now preparing to put the fuel and its byproducts on the market. A grade for a spur track from the M. C. & C. to the mine has been constructed, engineers are at work on the preliminaries for the tipple, an entrance to the mine has been started and work will be pushed rapidly.

Coal Trade Reviews

Current Prices of Coal and Coke and Market Conditions in the Important Centers

General Review

Extremely mild weather for this season of the year has been a great help to distributors of anthracite coal throughout the East generally. All-rail shipments to New England continue heavy and dealers' stocks are dwindling but premium prices are somewhat reduced. At Buffalo and vicinity, the market for anthracite is easier but a change to cooler weather would quickly revive it. Farther west prices remain generally unchanged with a fairly good demand; in some cases domestic sizes meet with a ready sale well above the circular. Despite the fact that production for the first 11 months of this year is 235,000 tons below that for the corresponding period of 1911, the conditions over the country as a whole appear to be somewhat easier and less fear is manifested of a general hard-coal famine.

Throughout New England dealers and consumers of bituminous coal have given up hope of obtaining Southern coals and are turning to the West Virginia grades for their supply. In the states east of the Mississippi the railroads in many cases require more fuel than their contracts can supply and they are accordingly resorting to confiscation. The car shortage which is abating in some sections of the country is still pronounced in western Pennsylvania while in Kentucky and Tennessee it is acute. This condition in these latter states is tending to stimulate the markets of Alabama.

Throughout the Middle West the market conditions are somewhat easier with but few and slight changes in prices. What few there are are downward.

In the Northwest the market is steadier and the car shortage less pronounced.

High prices and heavy demand still continue for coke. Many inquiries are being received by Pittsburgh operators from furnaces which are at present shut down but which are contemplating firing up about the first of the year. There is little if any free coke upon the market.

Boston, Mass.

The only feature of the week in bituminous is the brisk demand for Pennsylvania coals out of New York. Dealers and consumers, usually depending on Southern coals, have come into the market and there will be some active buying probably from now on, even though the aggregate is small. Many are giving up their expectations of Pocahontas and New River on account of the excessive demurrage and are now turning to such ordinary grades from the Pennsylvania districts as can be had at short notice. Prices are therefore 10@20c. higher than a week ago.

In anthracite, certain of the originating companies have announced an advance in water freights on their own barges from New York to Boston points. It amounts to 15c. and retailers are asking if this is to be a general move. The old rate of 50c. from upper New York Harbor has obtained now for a good many years and it is said certain other of the companies will not join in the advance. The extremely mild weather is of great help to the distributors of anthracite. As it is, dealers are getting only hand to mouth shipments and new instances of large retailers being down to bare boards are heard every day. Towing has been interrupted by a few days of thick weather and that is a further setback. The figures of the Boston Chamber of Commerce show that more than 31,000 tons less anthracite came to Boston in November than the same month a year ago. For the 11 months ending Nov. 30, there is a shortage of over 235,000 tons as compared with the same period in 1911.

Current wholesale quotations are as follows:

Clearfields, f.o.b. mine	$1.70@1.90
Clearfields, f.o.b. Philadelphia	2.95@3.15
Clearfields, f.o.b. New York	3.25@3.45
Somersets, etc., f.o.b. mine	1.80@2.00
Somersets, etc., f.o.b. Philadelphia	2.05@3.25
Pocahontas, New River f.o.b. Hampton Roads	3.50
Pocahontas, New River on cars Providence	4.50@4.75
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New York

Anthracite—The continuance of mild weather and also the increase in tidewater tonnage received by the companies has apparently helped to decrease the premium prices that were prevailing here on domestic sizes. Western shipments have been held up, due to the shortage of the proper car equipment throughout the entire anthracite region, and this has shown its effect by larger shipments to the East.

All-rail shipments to New England still continue heavy, but premium prices are materially reduced. There is no doubt but that if the extreme cold weather continues here that a shortage would still be felt, as there is quite a large gap to be filled up, none of the dealers having any stock of coal on hand to speak of. They are working from hand to mouth delivering coal to customers, and where they cannot receive their requirements from their regular source of supply, they are obtaining same from the middle-houses, who are charging premiums, ranging from $1 to $1.50 a ton. The general feeling is, however, that the situation will gradually be relieved, as far as high premium prices are concerned, as the supply on domestic sizes will soon meet the demand.

Prices range as follows:

	Upper Ports	Lower Ports
Broken	$5.00	$5.00
Egg	5.25@6.00	5.20@5.90
Stove	5.25@6.50	5.20@6.50
Chestnut	5.50@6.50	5.45@6.50
Pea	3.50	3.45@3.60
Buckwheat	2.75	2.25@2.60
Rice	2.25	1.80@1.95
Barley	1.75	1.25@1.70

Bituminous—The demand for bituminous coal is normal, but the supply is short, due to the car situation. The demand for contract coal still continues to be steady and persistent, and the buying on the part of the railroads still continues heavy. Ordinarily steam coal brings about the same prices as the higher grades. We quote the prevailing market about as follows:

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Pittsburgh, Penn.

Bituminous—Contrary to all expectations, the car supply is practically no better since the termination of lake shipments. Some operators report no more than a fair supply, while others complain that conditions are worse than formerly.

While it is not impossible that there is occasional shading, the general report is that the contract market is firmly held at the circular prices: Slack, 90c.; nut and slack, $1.05; nut, $1.25; mine-run, $1.30; ¾-in., $1.40; 1¼-in., $1.55, per ton at mine, Pittsburgh district.

Connellsville Coke—Demand for prompt furnace coke has continued fairly large, and has readily absorbed all offerings. A few sales may have been made last week at $3.85, but the general run of business was at $3.90 and $4, and this week opened on the same basis, with some sales at $3.90 but $4 being paid in many instances. Most operators believe that the usual decrease in shipments around the holidays will result in a large extra demand, bringing prices above $4. While most consumers are endeavoring to accumulate stocks, and some operators are purposely shipping extra coke on contract against the usual contingency, that there are generally some consumers caught short around the holidays.

The feature of the contract market is the appearance of a number of inquiries in the past few days, for the first half or all of next year, from consumers who were supposed to be already covered. In addition to this there is a sizable inquiry from furnaces not now in operation, but which are figuring on getting into blast about the beginning of the year. Inquiry now out from furnaces not in blast is equal to fully 40,000 tons a month, though whether all these will be able to get coke at prices which will justify their running is a question.

We quote contract prices at the same range as last week, but would state that it is questionable whether any standard coke can be obtained as low as the lower of the figures, while there is some standard coke probably available at somewhat less than the higher figures.

We quote: Prompt furnace, $3.90@4; contract furnace, first half, $3.25@3.50; year, $3@3.25; prompt foundry, $4.25@4.50; contract foundry, $3.25@3.75.

Philadelphia, Penn.

Real winter weather marked the beginning of the present week, and made additional calls for anthracite coal. The companies with headquarters in this city seem to feel that the diversion of some of the coal that has been going westward will enable them to place more in this, their natural market, but it will take a week and possibly two to bring about any evident easing up of the situation. No dealers have any coal in stock, and one of the largest indicated that his stove-coal receipts are being carted away as soon as received, and that he was by no means receiving all that he could dispose of. Every dealer has a tale of woe to tell about being short of coal.

There has, however, been some falling off in the demand for coal at a premium, the promises held out that the diversion of coal this way from Western consignment would likely make coal more free, has caused prospective buyers to postpone placing their orders for coal at an advance over circular.

It is undoubtedly true that considerable premium coal has been placed in this market, at advances of anywhere from 35c. to 75c., but in no case are the dealers asking more than $7 for stove, or $7.25 for nut. They seem to be willing to pocket the loss, if sustained, in order to supply their trade.

Pea coal, as indicated some weeks ago, is getting to be a rather scarce article, and with the prospect of higher contract prices the first of the year, contractors are taking in all of this size that they can find room to store, or that they can secure.

It is understood that contract prices on all the steam sizes will probably be the same as last year, with the exception of pea, in which there is likely to be a considerable advance.

Baltimore, Md.

Several of the smaller concerns doing business here, report a slightly easier market for gas coal during the week, but the larger companies, which supply the bulk of the trade, found the demand as active as it had been for weeks past. The business of these companies consists mostly of contract shipments, and owing to the fact that all consumers are now demanding the maximum tonnage under their contracts, little or no free coal was to be had.

Prices for all grades of coal remain about the same, and the coal men are still reaping a harvest of good profits. Dealers who could supply slack during the week found an active market for this grade of fuel, the buyers, for the most part, being cement companies. As a result of the increased demand for this fuel, the price advanced. Those who can furnish it, can get $1.50.

While the car situation is not all that can be desired, the trade reports a still further improvement. This was especially marked during the latter part of the week. Train movements were good on account of the mild weather, which is an aid to train operations.

The rise in the temperature in Baltimore did not seem to affect the anthracite market. Consumers know that good weather cannot last long, and have been quietly filling their coal bins.

Buffalo, N. Y.

The bituminous market is very unsteady just now, on account of the transition from summer to winter conditions and the closing of the lakes. Some members of the trade and especially consumers, state that prices are off, but while there is an occasional quotation that has been shaded, the market is really as strong as ever and there are some indications of extra strength, both here and elsewhere.

The consumer is trying to hold off for the time in the hope of better conditions, but he has so little stock to fall back on that he is far from controlling the market as he used to do. Consequently, the wise seller, whether from the mine or in the jobbing trade, is holding to his old prices, with the belief that they will remain firm and steady after the lake trade and its effects are out of the way. The market for slack, which is the first to be affected by the closing of the lakes, is strong.

Quotations are unsteady at $3 for Pittsburgh lump, $2.85 for three-quarter, $2.75 for mine-run and $2.50 for slack, with best Connellsville foundry coke $6.35. The idea prevails that all fuel and iron prices are at the top, which means that if any change is made it must be downward, though that would be merely on account of prices having gone too high.

The anthracite market is more easy, but all on account of the weather. If there should be a cold snap the clamor for stove and chestnut would be resumed full force. The premium paid for independent anthracite is subsiding, but will not disappear till the effect of lake closing is felt in full. Buffalo has probably shipped her last anthracite cargo by lake for 1912 with the loading of the steamer "Jenks" for Milwaukee with 7000 tons on the 7th. The amount for the season was 3,902,484 tons, as against 3,917,429 tons in 1911.

Columbus, Ohio

Warm weather still prevails throughout the central part of the state and this has helped to keep up coal conditions to a great extent. The car situation showed quite an improvement up until the last two days of the week when it took quite a slump. The mines are working better, orders are not coming in quite as fast but prices are holding up well.

The steam grade is the strongest feature of the market and this is helped by the railroads having to use a considerable amount of fuel in transit. Business still continues good with the manufacturers and mill men and they expect the present requirements to continue through the first half of the year. Some of the operators are optimistic of a great loosening up in the car situation and it is known that one concern has started a large consignment to the Northwest by rail with the intention of losing the cars so that the high prices may be maintained.

The domestic trade has shown quite a falling off in the last week. Dealers are not insisting on immediate deliveries, believing that if they are not anxious about stocking up there may be a drop in prices.

The shipments to the Northwest by rail are very active and it is presumed that if they continue they will show some large figures in tonnage for quite awhile.

Coal Trade Reviews

Current Prices of Coal and Coke and Market Conditions in the Important Centers

General Review

Extremely mild weather for this season of the year has been a great help to distributors of anthracite coal throughout the East generally. All-rail shipments to New England continue heavy and dealers' stocks are dwindling but premium prices are somewhat reduced. At Buffalo and vicinity, the market for anthracite is easier but a change to cooler weather would quickly revive it. Farther west prices remain generally unchanged with a fairly good demand; in some cases domestic sizes meet with a ready sale well above the circular. Despite the fact that production for the first 11 months of this year is 235,000 tons below that for the corresponding period of 1911, the conditions over the country as a whole appear to be somewhat easier and less fear is manifested of a general hard-coal famine.

Throughout New England dealers and consumers of bituminous coal have given up hope of obtaining Southern coals and are turning to the West Virginia grades for their supply. In the states east of the Mississippi the railroads in many cases require more fuel than their contracts can supply and they are accordingly resorting to confiscation. The car shortage which is abating in some sections of the country is still pronounced in western Pennsylvania while in Kentucky and Tennessee it is acute. This condition in these latter states is tending to stimulate the markets of Alabama.

Throughout the Middle West the market conditions are somewhat easier with but few and slight changes in prices. What few there are are downward.

In the Northwest the market is steadier and the car shortage less pronounced.

High prices and heavy demand still continue for coke. Many inquiries are being received by Pittsburgh operators from furnaces which are at present shut down but which are contemplating firing up about the first of the year. There is little if any free coke upon the market.

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Quotations in Ohio fields are:

	Hocking	Pittsburgh	Pomeroy	Kanawha
Domestic lump	$2.25		$2.35	$2.25
2-in	2.00	$1.60	2.00	2.00
Nut	1.50		2.00	
Mine-run	1.75	1.50	1.75	1.75
Nut, pea and slack	1.00		1.25	1.10
Coarse slack	1.00	1.25	1.00	1.00

Hampton Roads, Va.

With a curtailment of outside obligations and a strict adherence to contracts only, the situation at Hampton Roads slowly continues to improve. From present indications there may be some free coal here during the latter half of the month, although on account of the miners usually taking a Christmas holiday of at least a week, this surplus tonnage will likely be held to offset the output lost during the holiday layoff.

No sales have been reported on smokeless coal other than contract, although one sale is reported on a cargo of high volatile coal at over $3; considerably higher than the contract price for smokeless fuel.

Shippers are being much annoyed by railroad confiscation of coal *en route*. All local railroad fuel contracts are now being pressed for their maximum proportion. One purchasing agent of a large trunk line entering Norfolk made the statement that they have been unable to keep more than a week's advance supply on hand for over a month, and felt very uneasy as to the effect of the holiday suspension of mining.

In last week's report an estimate of slightly over 700,000 tons was made for November dumping at Hampton Roads. Official figures put the amount at 756,869 tons, divided; Norfolk & Western Ry. at Lamberts Point 247,255, Chesapeake & Ohio Ry. at Newport News 227,372, and Virginian at Sewells Point 182,242 tons. This was, therefore, an unsatisfactory month all around.

Birmingham, Ala.

The local coal market has been further stimulated by inquiries from territory heretofore supplied by mines in the Tennessee and Kentucky coal fields. This unusual condition is, of course, brought about by the car situation, which has been even more acute in the above mentioned states than in Alabama.

There is some anxiety among many of the coal operators of this district as to the probable effect on the future coal business of the vast hydro-electric power developments now in progress on nearby rivers. However, the wiser industrial men are not worrying, believing that cheap electricity will mean such an expansion in trade that there will still be a market for all the coal that can be produced by the mines now in operation.

Louisville, Ky.

Instead of showing any improvement, the car situation is rather worse than at any time in the past few months. Western Kentucky remains the chief sufferer, and the eastern Kentucky operator who receives as much as 50 per cent. of his requirements is doing exceedingly well.

Western Kentucky operators are out of the market completely as far as selling is concerned, and most of them are making strong efforts to buy coal to furnish their trade with a working supply. The nut and slack shortage is naturally a little more intense than last week or before, owing to the reasons indicated. Eastern Kentucky prices may be stated as follows: Block, $2.50@2.75; lump, $2.20@2.40; round, $2@2.10; straight run-of-mines, $1.25@1.35; No. 2 run-of-mines, $1.10; nut and slack, $0.75@1, with very little available at any price.

Indianapolis, Ind.

The mild weather has at last resulted in easing up the coal situation. The smaller domestic consumption has resulted in giving the mines a chance to catch up with retailers' orders and has enabled retailers to get something ahead in their yards for any increased demand that may follow the colder weather to come sooner or later. The railroads, too, have been able to give better car service and few mines this week have cause for complaint. Those that have not put in full time have worked five days. For the first time for several weeks there have been enough gondola cars. The lessening of the demand has permitted some accumulation at mines and 5 to 10c. concessions in prices have been obtained by retailers. The latter have not changed their quotations. Prices, f.o.b. the mines, are:

No. 4 mine-run	$1.25
Nos. 5 and 6 mine-run	1.10
No. 4 steam lump, 1½-in	1.40
Nut, No. 4	1.50
Egg	1.50
Domestic lump 2½-in	1.85
Domestic lump 5- and 6-in	2.00
Screenings, No. 4	0.90
Screenings No. 5 and 6	0.80
Washed coal, Nos. 1 and 2	2.00
Brazil block	2.50

The prices, f.o.b. Indianapolis, are 50c. higher than the above.

Detroit, Mich.

There seems to be much soft coal on hand at present, most of it being domestic sizes. The prices remain firm, and smaller sizes are in great demand. The market conditions are:

	W. Va. Splint	Gas	Hocking	Jackson Hill	Pocohontas	Pittsburg No. 8
Domestic lump	$1.80		$1.95	$2.75	$2.75	
Egg	1.80		1.95	2.75	2.75	
Nut	1.75		1.80		2.75	
¾ lump	1.60	$1.65	1.70			$1.75
Mine run	1.50		1.60		1.75	1.60
Slack	1.10	1.10	1.10		1.50	1.15

Anthracite—The conditions on this fuel remain unchanged, and very little circular coal is arriving. It was predicted when lake navigation closed the shipments on hard coal would be more liberal, but this, however, has failed to materialize and all the coal that is arriving is being disposed of at $1.75 above circular.

Coke—There are no shipments of Connellsville or Semet Solvay arriving at this point. Gas house is being quoted at $5 f.o.b. ovens.

Chicago

There has been a decline of about twenty-five cents a ton in prices for domestic coal. Better grades of Franklin County coal are selling for $2 to $2.10. A few weeks ago this coal commanded $2.25 to $2.50.

Franklin County coal, slightly off grade, can be purchased for $1.75 to $1.85, the mines. This represents a drop in the price within the past few weeks of approximately forty cents a ton.

The market for steam coal continues strong. All shipments made through regular channels at current prices are being absorbed. As has been pointed out before, the steady demand for steam coal is primarily due to excellent business conditions.

Indiana coals, including those from Sullivan, Greene and Clinton Counties, remain fairly strong with prices ranging in the neighborhood of $1.75 for the lump and steam, prices firm at the figures last quoted. About the same relative position is being maintained by Eastern coals. The price for mine-run, smokeless coal ranges from $1.35 to $1.50. Splint coal is quoted at $2. All shipments of this variety of fuel are being readily absorbed.

The demand for anthracite is not quite so heavy and, as a result, the producing companies are gradually catching up on orders placed some time ago. High prices still prevail for coke.

Prevailing prices at Chicago are:

	Sullivan Co.	Springfield	Clinton	W. Va.
4-in. lump	$2.87			
Domestic lump		2.07@2.57	$2.52	
Egg	2.62			4.30@4.55
Steam lump		2.12	2.27	
Mine-run	2.07@2.17	1.97	2.02	3.45@3.55
Screenings	1.62@1.67	1.52@1.57	1.52	

Coke—Prices asked for coke are: Connellsville, $6.75@7; Wise County, $6.75@7; byproduct, egg and stove, $5.75@6; byproduct, nut, $5.75@6; gas house, $6.

Minneapolis—St. Paul

The demand for coal in this territory has been a trifle stronger than in the few preceding weeks, as the weather has been somewhat colder, the Twin Cities enjoying one fall of snow and a day or two of zero weather.

The trade in the Northwest is beginning to get over the coal-shortage fear as it is generally thought that there is no danger of a serious coal famine. The

dealers in the country are well stocked up on nearly all grades of coal with the possible exception of some of the smaller interior towns which are short on anthracite. In the Twin Cities, while stocks are lower this year on both bituminous and anthracite coal than in previous years, the facilities for receiving stocks from the docks, from the Illinois fields and by all-rail, are such that coal enough can be headed this way to supply all normal demand.

Steam business is holding its own as regards volume, but in some cases it is thought concessions are being made in price to the heavy steam users. The manufacturing enterprises are endeavoring to stock up on steam coal in anticipation of continued activity during the winter months.

The retail trade in the Twin Cities has continued in steady volume and retailers say they have more orders on their books than they can fill for two weeks. They are having no trouble getting teams, but all equipment is being taxed to the limit.

The Chicago, Minneapolis, St. Paul & Omaha Ry., a subsidiary of the North Western, has issued an order that all cars unloaded by local industries, must not be reloaded by them, but must be returned to the company empty for use in the coal and perishable freight business.

Ogden, Utah

Colder weather, with some snow prevails at Ogden, with a general decrease in temperature over the entire Intermountain country, and indications are that for the next 60 days the coal mines will be kept busy shipping

The cold weather found all dealers well supplied with coal, and it will take a short time for them to move the stock on hand. Orders will then be placed with the mines for additional coal.

California is experiencing some unusual weather and dealers are drawing hard on the Wyoming and Utah mines. This territory depends to a large extent on the New Mexico mines for its supply, but as these mines are still troubled with a car shortage, they are unable to supply the demand. On Nov. 29, coal from New Mexico advanced to: Lump, $3.75; stove, $3.25; f.o.b. mines.

Quotations on Wyoming and Utah coals remain firm throughout the territory at the following rates:

	Wyoming	Utah
Lump	$2.75	$2.75
Nut	2.25	2.25
Mine-run	1.85	1.85
Slack	1.00	1.25

St. Louis, Mo.

Although a little winter weather has been experienced during the past week, it has not had a tendency to put the prices up to any extent, and the market is in exactly the same condition as it was a week or ten days ago.

The tonnage of anthracite grate and egg has been almost too much for the consumption, while chestnut is still slow in coming forward. The demand for coke has somewhat decreased, and everything is rather easy.

Indications are that the market will continue this way until about the first of the year.

The prevailing prices are:

Carterville and Franklin County	
6-in. lump and 3x6 egg	$1.50@1.70
No. 1 nut	1.25@1.35
Screenings	0.75@0.85
Mine-run	1.20@1.30
No. 1 washed	1.90@2.00
No. 2 washed	1.50@1.60
No. 3 washed	1.25@1.30
No. 4 washed	1.10@1.15
No. 5 washed	0.75@0.80
Trenton	
Lump and egg	$2.10
Big Muddy	
Lump and egg	$2.35
Mount Olive	
6-in. lump	$1.75
Staunton	
3-in. lump	$1.40
Standard	
6-in. lump	$1.25
2-in. lump	1.10
Screenings	0.45
Mine-run	0.95

Portland, Ore.

As winter progresses the coal market is gradually becoming a little steadier here and as was indicated this week by the withdrawal by dealers of the 50c. per ton discount on three-ton orders. The car shortage is less pronounced than a week ago and cars are now furnished quite freely. In eastern Oregon and Washington the season has been unusually open so far and the demand for coal from those sections has been below normal. Colder weather may be looked for there any moment, however. It now appears certain that no Australian coal will come here this season. Quotations here for the present, including $1 per ton cartage, are as follows:

Australian	$10.00
Rock Springs	10.00
King coal	9.50
Washington lignite	7.00@7.50
Miscellaneous	7.00@8.00

Production and Transportation Statistics

November Anthracite Shipments

Anthracite shipments for November amounted to 6,165,536 tons, a decrease of 27,778 tons from November, 1911. The shipments in November, 1911, however, were very large and established a record for the eleventh month of the year. The shipments last month were larger than the November shipments in either 1910, 1909 or 1908.

The Philadelphia & Reading Ry. carried the largest tonnages last month (1,243,111), the Lehigh Valley was second (1,177,732), and the Lackawanna was third (889,560). The tonnages of the other roads were as follows: C. R.R. of N. J., 812,870; Erie, 708,611; D. & H., 635,575; P. R.R., 509,752; N. Y., O. & W., 188,325.

The shipments for the eleven months ended Nov. 30 amounted to 57,666,076, as compared with 63,838,872 tons in the corresponding period of last year. This shows that a considerable part of the loss in tonnage caused by the suspension of last April and May has been recovered through the full-time operation of the mines and the consequent heavy production since work was resumed.

Connellsville Coke

The *Courier* reports production in the Connellsville region as follows:

Production	Week Ending Nov. 23	Nov. 30	Dec. 7
Connellsville	221,343	218,546	214,990
Lower Connellsville	183,309	181,564	178,016
Total	404,652	400,111	393,006
Shipments To	Cars	Cars	Cars
Pittsburgh	4,126	2,863	3,410
West of Pittsburgh	6,989	8,003	7,197
East of Region	880	998	1,019
Total	11,995	11,864	11,626

Foreign Markets

Oriental Markets

Japan—A few of the 1913 contracts have been settled, and though the price in taels is about the same as last year's contracts, it really means better prices for the sellers owing to the more favorable exchange. This, however, is offset to a certain extent by the higher rates of freight, which are bound to rule next year, and upon which the Japanese must make their calculations.

Fushun—Prices for next year's contracts are being well maintained in spite of the competition with Kailan coal.

Kaila—Owing to the scarcity of tonnage, arrivals during the fortnight have been small; prices are well maintained and when freights become normal, deliveries to consumers will no doubt be considerably increased.

Spanish Imports

The following is a comparative statement of Spanish imports for the first nine months of this year and last year:

	1911	1912
Coal	1,552,419	1,653,010
Coke	234,771	266,990

Great Britain

Nov. 29—The market maintains a strong tone both for large and small qualities. Steams are very full, and on this account prompt business is somewhat restricted. Sellers are holding firmly for higher values for forward loading, and a fair amount of business is being arranged:

Best Welsh steams	$4.26@4.32
Best seconds	4.02@4.08
Seconds	3.90
Best dry coals	4.26
Best Monmouthshires	3.96
Seconds	3.72
Best Cardiff smals	2.88
Seconds	2.58

The prices for Cardiff coals are f.o.b. Cardiff, Penarth, or Barry, while those for Monmouthshire descriptions are f.o.b. Newport; both exclusive of wharfage, and for cash in thirty days, less 2½%.

Prices of Mining Supplies

Current Prevailing Prices of Mining Commodities Compiled as a Convenient Reference for Buyers

The Markets in General

Steel trade conditions have improved wonderfully during the month following the presidential election, and the statistics compiled of the pig-iron production show that a new high record was made in the daily output during November. In the United States, more iron and steel is being made every day, than at any previous time. In spite of this, orders have accumulated on the books of manufacturers, and for some commodities, twenty to twenty-five weeks must elapse after specifications are received by the manufacturers before the goods can be shipped. All the steel mills of the country are using every effort to turn out a maximum tonnage, and prices continue to advance. The only weakness in the entire market has been in scrap iron, which is slightly lower than it was a month ago. This market has always been an excellent index of activity in the steel trade, and while the present slump may be due to natural causes, such as the inability of mills to take care of the incoming material, it may, on the other hand, forecast a decline in the demand for iron and steel products.

Business in general trades is just as active as in the steel industry, although, because of the magnitude of the iron and steel output and the fact that it employs so much labor, and is susceptible to such violent fluctuations, more attention is paid to this than to any other single branch. The manufacturers in the United States are busier now than ever before in turning out a tremendous volume of orders which, however, fail to satisfy consumers. In every part of the country, manufacturers are adding to their facilities, extending shops and factories. The call for the material alone for these extensions is sufficient to employ a good sized army of laborers.

Railroads have more traffic than they can conveniently handle, but the work of moving passengers and supplies is better accomplished than at any previous time. The car shortage, while a serious factor, is not nearly as hampering as in 1907, and it must be remembered that while railroads are short 50,000 cars, they have approximately 2,450,000 cars, which are carrying freight and moving over the rails at greater speed than ever before. Since 1907, numerous extensions by the railroads, or rather improvements to existing facilities, have been made, principally in New York. New tracks have been laid and the alignments of existing trackage improved.

Financial conditions show a decided improvement in the last fortnight, largely because of the reductions in the price of speculative stock, but also on account of the Balkan wars. Thanks to the excellent control American bankers have over foreign gold because of the large exports of agricultural products, this metal is now being shipped to the United States, and credit is more easily obtained.

LABOR

Conditions have been so favorable for surface working this month that not enough men have been found to do the work. Labor was better employed on Dec. 1, particularly outside labor, than in any year since 1906, and it is probable that laboring men are receiving higher wages this year than at the former date. During the month, there have been few labor disturbances, save in the Pittsburgh steel district, where a strike occurred at Homestead, which resulted in tying up considerable material. This, however, is a spasmodic affair.

Of prime importance was the settlement of the engineers' strike by the Arbitration Board. This body decided in favor of a gradual advance in the wages of enginemen, although much less than the enginemen desired, but the important finding of the board was that neither the railway companies nor the engineers were alone in the controversy, the general public had a large interest at stake, and this interest could not be disregarded. The board also proposed the establishment of a minimum wage for enginemen, and should its recommendation be taken seriously, it will mean government regulation of wages just as much as government regulation of freight rates. The unsatisfactory feature in the report was the fact that the agreement is to last a year only.

IRON AND STEEL PRODUCTS

All the mills in and around the Pittsburgh district, with the exception of those at Homestead, are as busily engaged turning out finished steel products as at any time this year. This means that these mills are now working at the maximum of capacity. The only reason, the Homestead mills are not working is because of a strike there. This will probably be settled in the near future. The production of pig iron during November made a new high record, and it is probable that for December it will also average up well.

Price changes have not been numerous during the month, and buying for forward delivery has been less active. This is principally because any buying which took place in November will have to wait for delivery until June of next year, or later, and few care to look so far into the future.

Railroads are not buying equipment as they did last month, because it will be impossible to furnish cars ordered at the present date before September of next year at the earliest. Then, too, prices of equipment have advanced rapidly, especially steel-car equipment, and steel cars are now fully $300 higher than they were a year ago. This is an advance of more than 25 per cent.

The shortage in bars is more pronounced than in any other line, and sheet iron is likewise in active requisition.

Roofing and Black Sheets—The market is strong, and, while no change has been made in the base price, premiums of $3 to $4 are freely paid for prompt delivery. Practically none of the mills is in a position to ship orders within two months. The stocks in warehouses are badly broken in sizes. Most of the material which has been finished at the mills has been shipped out direct, and warehouses had little chance to store up on sizes and gages. Therefore, business is especially unsatisfactory. Orders are now being taken for May delivery, and some mills are not in a position to accept orders for anything except delivery subsequent to July 1, 1913.

Extras for roofing sheets are as follows: Corrugated, 2-in. to 5-in., 5c. per 100 lb.; painted roofing, 12 to 18 gage, 55c. per 100 lb.; 19 to 24 gage inclusive, 10c. per 100 lb.; 25 to 28 gage inclusive, 15c. per 100 lb. The following tables give the price of sheets in carload lots, f.o.b. the Pittsburgh district:

	Cents per lb. Black	Galvanized
Nos. 10 to 12	1.90	2.40
Nos. 13 and 14	1.95	2.50
Nos. 15 and 16	2.00	2.65
Nos. 17 to 21	2.05	2.80
Nos. 22, 23 and 24	2.10	2.90
Nos. 25 and 26	2.15	3.10
No. 27	2.20	3.25
No. 28	2.25	3.40
No. 29	2.30	3.50
No. 30	2.40	3.70

The following prices for small lots of sheets are from store Chicago:

	Cents per lb. Black	Galvanized
No. 10	2.25	
No. 12	2.25	2.85
No. 14	2.25	
No. 16	2.45	2.95
Nos. 18 to 22	2.45	3.10
No. 24	2.55	3.25
No. 26	2.60	3.15
No. 27	2.60	3.75
No. 28	2.70	3.90
No. 30	2.85	4.00

Old Materials—Prices declined rather sharply during the month and are now as low as they were on Oct. 1. This decline occurred for two reasons (1) the weather permitted the gathering of more scrap than usual, and (2) the market seemed congested with material. Numerous speculators purchased throughout 1910 and 1911, and are now disposing of their stocks at handsome profits.

The following prices per gross ton are named, f.o.b. New York:

Heavy-melting steel scrap	$12.00@12.50
No. 1 railroad wrought	13.75@14.25
Pipes and flues	11.00@11.50
Cast borings	8.50@9.00
Machinery cast, broken up	12.00@12.50
Stove plate	9.75@10.00
Malleable castings	11.50@12.00
Wrought turnings	9.00@9.50

In Chicago, the decline seems to have been stopped, and while no advances have been made, it is evident that the lowest levels have been reached for the time being. Since Dec. 1, very little scrap has come on the market, showing that holders of old material are not disposed to sell unless they can secure rather full prices. Quotations are as follows:

	Per gross ton
Heavy-melting steel scrap	$13.00@13.50
	Per net ton
No. 1, railroad wrought	$13.00@13.50
No. 2, railroad wrought	12.00@12.50
No. 1, cast scrap	13.00@13.50
Pipes and flues	10.25@10.75
Agricultural malleable	11.75@12.25
Railroad malleable	13.50@14.00

In Pittsburgh, a similar tendency has been noted, and the market there is somewhat stronger than a fortnight ago. Prices, however, are lower than at the beginning of November. Quotations, f.o.b. Pittsburgh, are as follows:

Re-rolling rails	$16.25@16.50
No. 1 cast scrap	14.50@14.75
Heavy-melting steel scrap	14.75@15.00
Old car wheels	15.75@16.00
Machine shop turnings	10.50@10.75
Stove plate	19.75@11.00
Cast borings	10.00

been less active during the month, and in the North, very little business has been placed. On the other hand, at Southern points the demand has been fairly active, and the foundries in and around the Birmingham district have been urged to hasten deliveries. They are now from one to two months behind with their orders. Quotations show little change from last month, and per net ton of 2000 lb. are as follows:

Chicago, 4-in., $31; 6- to 12-in., $29; larger sizes, $28.

New York, 6-in., $24@25.

Birmingham, Ala., 4-in., $25; 6-in. and larger, $22.

Steel Rails—Never have the railroads purchased rails in as large quantity so early in the year as in this one. It is undoubtedly true that purchases for 1913 delivery as so far made, exceed 2,300,000 tons. Mills accepting orders now are not in a position to make delivery before July of next year, and even such delivery would be uncertain. There seems to be continued scarcity of the smaller sizes such as 20- and 30-lb. rails. Quotations, f.o.b. Pittsburgh, are as follows: Standard sections, 50 to 100 lb. per yd., 1.25c. per lb.; 40 to 50 lb., 1.21c.; 12 lb., 1.25c. Relaying rails in Chicago, 40 to 45 lb. and under, subject to inspection, are held at $22@24 per ton. Standard section of relaying rails in the same market are held at $23@24 per ton. Some of these rails can be had at other Middle West points than Chicago.

Steel Mine Timbers—This is a new product which steel companies are endeavoring to introduce more widely, and consequently they maintain a generous supply to be shipped out on short notice. The demand is not large, but is supplied promptly. Quotations for large lots continue irregular at 1.40@1.50c. per lb. f.o.b. Pittsburgh.

Track Supplies—All of the railroads in the country are making an effort to get in track supplies as early as possible, and in consequence much higher prices have been named. In Pittsburgh, spikes are now quoted at $1.90@1.95, and in Chicago at $1.95@2.05. Angle bars are firm at $1.50@1.60, and bolts with square nuts are $2.30@2.40. All of these prices are per 100 lb.

Bars, Concrete Reinforcing—In no line of the steel trade has more activity been shown than in the reinforcing-bar market. The premiums for prompt delivery are higher in this line than in any other. While mill shipments in Pittsburgh can be had at 1.45@1.50c. base, bars from stock are 1.95@2.05c. This represents a premium of $3@4 per ton for prompt shipment. Bars ordered from the mill cannot be had before May or June, and warehouse stocks are also subject to some delay.

Wire Rope—While the discounts are unchanged, and also the net prices per foot, the market is really much stronger, for the demand has shown an improvement. There is a scarcity of supplies. The net prices for the sizes most generally used are as follows: 2-in., 57@76c. per ft.; 1¼-in., 23@32c. per ft.; ¾-in., 10@13c. per ft. All of these prices are for large lots, f.o.b. Pitsburgh.

Merchant Pipe—The output of pipe this year not only establishes a new high record, but orders already taken for next year indicate that another high record will then be made. Mills have practically all the business they can take care of for the first four months of next year, and many of them are well sold up until July 1. Prices are steady, but there is not the talk of higher quotations that there was a month ago. Discounts are unchanged, and will be found on page 482 of the issue of Oct. 5. The net prices of the sizes in most general use, f.o.b. Pittsburgh, are as follows:

	Steel pipe in cents per ft. f.o.b. mill	
	Black	Galvanized
½-in.	3.50	4.80
¾-in.	4.70	6.55
1-in.	5.65	7.80
2-in.	7.60	10.20
2½-in.	12.20	16.80
3-in.	15.95	22.00

Nails—Considerable talk has been heard regarding higher prices for nails. Some of the manufacturers have strongly opposed the rise on the ground that should a new schedule go into effect now, buying will be postponed until dealers and consumers actually need a supply, and in the meantime manufacturers will be compelled to stock their material. Wire nails are held at $1.75, base in Pittsburgh, and cut nails $1.70. In Chicago, wire nails are $1.93 base, and in New York, $2. All of these prices are per keg of 200 lb.

Merchant Shapes—Stocks in the hands of jobbers are badly broken, and higher prices are demanded, not because there has been a new schedule of wholesale prices, but because the mills cannot furnish material as promptly as consumers request, and the latter are buying from warehouse stocks. The following quotations are from jobbers' stores in New York or Chicago, and include some of the better known special brands of iron and steel:

Refined iron	Cents per lb.
1- to 1½-in. round and square 1½- to 4-in. x ¼- to 1-in. 1½- to 4-in. x ¼- to 5-in.	2.00
Rods:	
⅜- and ½-in. round and square	2.10
Angles:	
3x¼-in. and larger	2.15
3x⅜-in and ¼-in.	2.50
1½ to 2½x¼-in.	2.25
1½ to 2½x¼-in. and thicker	2.15
1 to 1½x⅛-in	2.25
1 to 1½x¼-in.	2.36
Beams	2.15
Channels, 3-in. and larger	2.15
Bands, 1½ to 6x¼ in. to No. 8	2.30
"Burden's Best" iron, base price	3.35
Burden's "H. B. & S." iron, base price	3.35
Norway bars	3.60
Bessemer machinery	2.00
Cast steel, base	7.00
Special cast steel, base	14.00

Wire—The demand continues excellent from all quarters, and some of the makers propose higher prices. The same objection has been offered to an advance in this line as in nails, that it would only postpone buying, and perhaps open a way for some price cutting by the smaller mills, should the demand not equal expectations. Quotations for plain barbed wire are $1.75@1.85 f.o.b. Pittsburgh. Galvanized is held at $2.10@2.15. Annealed fence wire is $1.55@1.65, and galvanized, $1.95@2.05 Pittsburgh.

All of these prices are per 100 lb.

Structural Materials—The demand for ordinary shapes from fabricators is greater than ever before. Delays are exasperating, and those who must have fabricated work done quickly are compelled to buy the steel shapes in the open market. All the mills rolling shapes are from four to five months behind their orders, and much building work is held up on account of this. Ordinary angles, beams, channels and tees are 1.50@1.55c. Pittsburgh, and 1.63@1.73c., f.o.b. Chicago. For tank work, plates are in just as active demand. Car builders who make a specialty of coal cars, particularly the smaller sizes for use in mines, have much difficulty in finding sufficient material to meet their needs. Plates are held at 1.50@1.55c., Pittsburgh, for future delivery, and 1.70@1.80c., Pittsburgh, for prompt delivery. In Chicago, the price for future shipment is 1.63@1.68c., and for prompt delivery, 1.83@1.88c.

Belting—The market is strong, but discounts are unchanged. The demand is not as great as it was a month ago, nevertheless it is still large.

Discounts on leather belting continue unchanged from last month, and may be found on page 482 of the issue of Oct. 5.

Net prices per foot for various widths of leather belting are as follows:

Width Inches	Extra heavy	Heavy	Light
1	$0.11	$0.10	$0.08
1½	0.17	0.14	0.11
2	0.23	0.19	0.15
2½	0.28	0.24	0.19
3	0.34	0.29	0.23
3½	0.40	0.34	0.27
4	0.46	0.38	0.31
5	0.57	0.48	0.38
6	0.68	0.58	0.46
7	0.80	0.67	0.54
8	0.91	0.77	0.61

Packing—While there is a wide range of prices from various dealers, the market may be quoted as follows in general: Asbestos wick and rope, 13c. per lb.; sheet rubber, 11@13c.; pure gum rubber, 40@45c.; red sheet, 40@50c. Cotton packing is held at 16@25c.; jute at 3¼@3½c., and Russian at 8@9c.

Petroleum Products—Prices on petroleum products advanced very rapidly, especially during the last month. This applies particularly to the price of crude oil from wells where there have been two advances in the month, and prices are now 25 to 50% higher than earlier in the year. In reality, the wide advance which has been quoted for gasoline and kerosene, and which is so well known to all consumers, is not equal to the advance in percentages, and certainly not to the actual figures that the oil refiners have been obliged to pay for crude oil at the wells. The quotation for kerosene oil in New York is 8c. per gal., and gasoline is sold at 19¾c. Lubricating oils are steady and unchanged at the following quotations:

	Cents per gal.
Cylinder, dark	23@30
Cylinder, steamer refined	16@24
Stainless, white, 32 to 34 gravity	30@32
Lemons, 33 to 34 gravity	19@21
Dark, 32 gravity	17@20
Crank-case oil	17@19

Portland Cement—Manufacturers of cement have all the business they can take care of, and the continued fall weather in the last two months has materially benefited them, for contractors have been able to do outside work, which ordinarily would have to be postponed about the middle of November. There is probably less cement stored now than at any time before in the last eight years, and conditions seem to be most favorable for the continuation of the large demand which has been noted this year.

Prices are steady and unchanged at $1.58 New York, less 40c. for bags returned.

In Pittsburgh, $1.58 is quoted, less 40c. for bags returned. These quotations represent a price of 90c. per bbl. in bulk at the mill.

Paints—The continued decline in the price of linseed oil must, in the near future, bring about a revision in the price of paint. Linseed oil earlier in the year was sold around 90c. per gal., and for several months sold from 70@80c. It has lately declined to less than 50c. per gal. These are lower prices than have ruled for several years. The supply is enormous, and with lower prices for lead, there can be little excuse for keeping up the price of paint.

Spirits of turpentine is likewise cheaper, selling around 36@38c. per gal.

White lead in oil in 100-, 250-, and 500-lb. kegs is 6¾@7c. per lb. Red lead and litharge, in lots of 500 lb. and over, are unchanged at 7c.

Chain—Not as much chain has been sold in the last month as previous to the higher prices, which were advanced on Oct. 26.

Prevailing quotations per 100 lb. f.o.b. Pittsburgh in kegs of 500 lb. are as follows:

⅜ in.	$3.50
¼ in.	3.05
⅝ in.	3.05
¾ in.	2.90
⅞ in.	2.90
½ and ⅝ in.	3.00
⅝ and ¾ in.	2.90
¾ and ⅞ in.	2.80
⅞ and 1 in.	2.70
1 to 1¼ in.	2.60
Extras for BB	
⅜ in.	1.50
¼ in.	1.50
⅝ in. and larger	1.25
Extras for BBB	
⅜ and ¼ in.	2c.
⅝ and larger	1.75c.

MISCELLANEOUS

Roofing Paper—The demand is larger, but not as insistent as it was early in the year.

Quotations in New York are as follows:

	Per roll of 500 sq.ft.
Rosin sized sheathing, 20 lb.	28c.
Rosin sized sheathing, 30 lb.	43c.
Rosin sized sheathing, 40 lb.	58c.
Roofing, Rubber	
	Per roll of500 sq.ft.
1 ply, 35 lb.	$1.90
2 ply, 45 lb.	1.10
3 ply, 55 lb.	1.30

Insulators—Prices are without change. Glass insulators, in lots of more than 1000, and less than 10,000, are sold at the following prices per 1000: Double petticoats, 20-oz., at $33; Western Union, $30.25; No. 2 cable, $53.90; No. 4 cable, $210; Muncie type, 7-in., $236.50; No. 3 triple petticoat, 4½-in., $90.75.

Telegraph Wire—The prices in cents per lb. for lots in fair size, the wire being measured in Birmingham wire gage, are as follows: "Extra Best Best," Nos. 6 to 9, 4¾c.; Nos. 10 and 11, 4½c.; No. 12, 4⅝c.; No. 14, 5⅛c.; "Best Best," Nos. 6 to 9, 3½c.; Nos. 10 and 11, 3⅜c.; No. 12, 3½c.; No. 14, 4c. Actual freight is allowed from Trenton, N. J., where it does not exceed 25c. per 100 lb.

Index of Coal Literature

Monthly list of the world's best articles on coal and coal mining

The following is a list of abbreviations used below:
A.E.G.-Ztg. = A.E.G.-Zeitung.
Am. Lab. Legis. Rev. = American Labor Legislation Revue.
Ann. Mines = Annales des Mines.
Ann. Mines Belgique = Annales des Mines de Belgique.
Austral. Min. Stand. = Australian Mining Standard.
Berg-Huttenmänn. Rdsch. = Berg- und Huttenmännische Rundschau.
Bull. Am. Inst. Min. Eng. = Bulletin American Institute of Mining Engineers.
Can. Eng. = Canadian Engineer.
Can. Min. Jl. = Canadian Mining Journal.
Chem. Eng. = Chemical Engineer.
Coll. Guard. = Colliery Guardian.
Comp.-Air Mag. = Compressed Air Magazine.
Compt. Rendus Acad. Sc. = Comptes Rendus de l'Académie des Sciences.
El. Eng. = Electrical Engineering.
El. Jl. = Electrical Journal.
El. Kraftbetr. = Electrische Kraftbetriebe und Bahnen.
Eng. Contract. = Engineering Contractor.
Eng. Min. Jl. = Engineering and Mining Journal.
Eng. News = Engineering News.
Fördertechnik = Die Fördertechnik.
Geol. Mag. = Geological Magazine.
Handel und Ind. = Handel und Industrie.
Int. Mar. Eng. = International Marine Engineering.
Inst. Min. Metal. = Institute of Mining and Metallurgy.
Int. Volkswirt = Internationaler Volkswirt.
Iron Coal Trades Rev. = Iron and Coal Trades Review.
Jl. Soc. Chem. Ind. = Journal of the Society of Chemical Industry.
Jl. Ind. Engin. Chem. = Journal of Industrial and Engineering Chemistry.
Jl. Royal Soc. Arts = Journal of the Royal Society of Arts.
Jl. S. Afr. Inst. Eng. = Journal of the South African Institute of Engineers.
Kohle Erz = Kohle und Erz.
Lumière El. = Lumière Electrique.
Min. Eng. = Mining Engineer.
Mines Minerals = Mines and Minerals.
Min. Sc. Press = Mining and Scientific Press.
Min. World Eng. Rec. = Mining World and Engineering Record.
Mon. Ind. Gaz. = Moniteur de l'Industrie du Gazet de l'Electricité.
Montan. Rdsch. = Montanische Rundschau.
Oesterr. Z. Berg- Huttenwes. = Oesterreichische Zeitschrift fur Berg und Hüttenwesen.
Portefeuille Econ. Machines = Portefeuille économique des machines.
Proc. Acad. Pol. Sc. N. Y. = Proceedings of Academy of Political Science, New York.
Proc. Am. Inst. El. Eng. = Proceedings of American Institute of Electrical Engineers.
Proc. S. Wales Inst. Eng. = Proceedings of South Wales Institute of Engineers.
Rev. Noire = Revue Noire.
Rev. Univ. Mines = Revue Universelle des Mines.
Saarbrucker Berg. Kal. = Saarbrucker Bergmanns Kalendar.
S. Afr. Min. Jl. = South African Mining Journal.
Soz.-Technik = Sozial-Technik.
Stahl Eisen = Stahl und Eisen.
Stein-Braunkohle = Stein und Braunkohle.
Tech. Rdsch. = Technische Rundschau.
Techn. Wirtsch. = Technik und Wirtschaft.
Tekn. Tidskrift = Teknisk Tidskrift.
Trans. Inst. Min. Eng. = Transactions Institute of Mining Engineers.
Trans. Min. Inst. Scot. = Transactions of Mining Institute of Scotland.
Trans. Inst. Min. Eng. = Transactions of the Institute of Mining Engineers.
Trans. Manchester Geol. Min. Soc. = Transactions of the Manchester Geological and Mining Society.
Ung. Mont. Ind. = Ungarische Montanindustrie und Handelszeitung.
Z. Damptkessel-Betr. = Zeitschrift für Dampfkessel und Maschinenbetrieb.
Z. El. Mach. = Zeitschrift für Elektrotechnik und Maschinenbau.

Note: We shall be glad to obtain for readers, where possible, copies of the papers referred to.

I—GENERAL

Text of Bill for the Nationalization of Coal Mines. "Coll. Guard." vol. 104. 2702. p. 740-2. 15c.

The Effects of the English Miners' Strike on other Industries. (Die Wirkungen des englischen Kohlenarbeiterstreiks auf andere Industrien.) "Arbeitsnachweis." 1912. 3. p. 113-6.

Conservation of Nova Scotian Coal Fields. N. A. Nicholson. "Canad. Min. Jl." vol. 33. 19. p. 671-4. 40c.

American Coals which are Suitable for Export. J. S. Burrows. "Black Diamond." 1912. p. 23.

Our Anthracite Coal Supply and Its Conservation. Wm. Griffith and E. T. Connor. "Proc. 8th. Int. Congr. Appl. Chem." 1912. vol. 24. p. 79-113.

Astounding Growth of the American Coal Output. "Black Diamond." 1912. p. 30.

How Pocahontas Coal became known. "Black Diamond." 1912. p. 34.

Coal Export of the Rhenish-Westphalian Coal Syndicate in 1911. (Kohlenenausfuhr des Rheinisch-Westfaelischen Kohlensyndikats i. J. 1911.) "Kartell-Rdsch." 1912. 7. p. 638-41.

Report on the Coal Mining Industry in Saxony-Altenburg in 1911. (Bericht ueber den Kohlenbergbau im Herzogtum Sachsen-Altenburg waehrend d. J. 1911.) 4 to 11 p. Altenburg. 1912.

Hard Coals of Germany, Mining, Dressing and Utilization. A. Haenig. (Die Steinkohle, ihre Gewinnung und Verwertung.) Leipzig, 1912.

Coal Finance Politics in Saxony. (Kohlenpolitik des saechsischen Fiskus.) "Kartell-Rdsch." 1912. 7. p. 618-9.

Coal Consumption, the Heating Plant Industry and the Coal Trade. Polster. (Kohlenkonsum, Heizanlagenindustrie u. der berufsmaessige Kohlenhandel.) "D. Kohlentzg." 1912. 5. p. 47-8. 40c.

Ten-year Memorial Volume of Central Union of Coal Dealers of Germany, describing Organizations and Activities. O. Polster. (Festschrift zum 10 Jahr Bestchen des Centralverbandes der Kohlenhaendler Deutschlands.) 46 pp. Hamburg, 1912.

The Reserve Fund and its Status in State-owned Mines. Gutdeutsch. (Ueber Wesen und Bedeutung von Reservefonds mit besonderer Berueecksichtigung der Beduerfnisse des Staatsbergbaus.) "Zts. f. Berg., H., & Salinenw." 1912. vol. 60. 2. p. 147-85.

Statistics of Output per man per shift in the Leading Coal Fields of Prussia, 1888-1911. (Uebersicht ueber die in den Haup-Steinkohlenbezirken Pruessens, 1881-1911 auf Arbeiter und auf 1 Schicht erzielte Foerderung.) "Zts. f. d. Berg-H., & Salinenw." vol. 60. Statistical No. 1, p. 46-8.

Mine Valuation and Mine Finance. H. C. Hoover. "Min. Mag." vol. 7. 4. p. 275-7. (Assured value and prospective value with the redemption of capital considered.)

Coal Supplies of Austria. W. Petrascheck. (Die Kohlenvorraete Oesterreichs.) "Montanische Rundschau." 1912. p. 938. 30c.

Competition between Coal and Hydroelectric Power in Switzerland. (Schwarze und weisse Kohle in der Schweiz.) "Organ d. Bohrtechniker." 1912. p. 214.

The International Congress of Miners on the Question of Nationalizing the Coal Mines. (Der Internationale Bergarbeiterkongress zur Frage der Verstaatlichung d. Kohlenbergbaus.) "D. Arbeitg-Ztg." 1912. 28.

International Miners' Congress (Proceedings) (Internationaler Bergarbeiterkongress.) "Corr. Bl. Gewerksch Deutschl." 1912. 31. p. 464-7.

Experimental Construction of Schools in Colliery Districts. "Jl. Soc. Archit." vol. 5. 59. p. 413-6. (Methods of counteracting the danger of subsidences.)

Index of Mining Engineering Literature. W. R. Crane, vol. 2. 8vo. Chapman & H. 12s. 6d.

II—GEOLOGY

Notes on Mine Surveying. H. G. Henderson. "Min. Min." vol. 33. 3. p. 169-70. 2 fig.

The Frequent Occurrence of Ankerite in Coal. T. Crook. (Sulla frequenta presenza dell' ankerite nel carbon fossile.) "Rassegna Mineraria." 1912. p. 21.

Cannel Coal Fields in Kentucky. H. D. Easton. "Coal Age." vol. 2. 14. p. 454-6. 4 fig. 3 tab.

Coalfields of the Consolidation Coal Co. "Black Diamond." 1912. p. 40-6.

The Appalachian Coal Field and Its Fuel Products. A. Bement. "Black Diamond." 1912. p. 26.

The Coal Fields of King County. G. W. Evans. "Bull. Wash. Geol. Survey." 1912. 3. 247 pp.

The Sub-Bituminous or "Arsa" Coal of Carpano, Istria. Ed. Donath & A. Indra. (Ueber die Arsakohle von Carpano, Istrien.) "Chem.-Ztg." 1912. p. 1118. 25c.

The Arkansas Semi-Anthracite Field. A. H. Shaw. "Coal Age." vol. 2. 15. p. 486-8. 3 fig.

Coal Fields of Wind River Region, Wyoming. E. G. Woodruff and E. Winchester. "Min. Eng. World." vol. 37. 16. p. 719-20. 1 map.

Coal Discoveries in British Columbia. W. F. Robertson. "Coll. Guard." vol. 104. 2705. p. 888-90. 15c.

Some Lignite Deposits along the Bahia Coast, Brazil, and the Possibilities of Working. Freise. (Einige Braunkohlen Vorkommen an der Kueste des brasilianischen Staates Bahia.) "Braunkohle." 1912. p. 210-13. 20c.

Geology of the Five Major Coal Fields of Prussia. H. Willert. (Geologie der fuenf grossen preussischen Steinkohlenblagerungen.) Leipzig. 1912.

Teubner's Monographs of Commercial Geography of Germany, Vol. II. Von der Aa. (Steinkohle, Braunkohle, Eisenerz und Eisenindustrie.) Liepzig and Berlin, 1912. Map and explanatory text. (The hard coal, lignite, iron-ore and siderurgic industries.)

Newer Map-making Methods and Equipment on the Coal Seam and Topographic Charts of the right Rhine-Westphalian Coal Field. L. Mintrop. (Neue Floez-und topgraphische Ubersichtskarten des rechtsrheinischwestfaelischen Steinkohlenbezirks.) "Glueckauf, "1912. p. 1225-95. 75c.

Coal in the Vladivostock District, Siberia. A. F. Bordeaux. "Coal. Merch." vol. 25. 633. p. 489. 1 map. 15c.

The Coal Seams of the East Cracow Coal Field and the Central Galicia District. Dr. Grzybowski. (Die Ostliche Grenze des Krakauer Kohlenbeckens und das mittelagalizische Becken.) "Montan. Rundsch." 1912. p. 918-25. 30c.

III—MINING TECHNOLOGY

The Industrial Economy of Machinery in Coal Mining. C. Ilgner. (Die Maschinenwirtschaft der Kohlengruben.) "Montan. Rundsch." 1912. p. 939. 30c.

Advanced Practice in Illinois Coal Fields. W. Roberts and O. Cartlidge. "Min. Min." vol. 33. 3. p. 121-5. 9 fig. (Buckner. No. 2 Mine, Franklin Co. Ill., surface and underground arrangements.)

Automatic Weighing and Recording Machines for Coal in Bulk. "Railw. News." vol. 98. 2546. p. 900-2. 5 fig. 30c

Rotary v. Puncher Coal-cutters. A. E. Liwehr. (Radschraemmaschine oder Stangenabbauschraemmaschine.) "Montanist. Rundschau." 1912. p. 929.; p. 1200. 30c.

Use of the Pick-Quick Electric-driven Coal Puncher at Bascoup Colliery, Belgium, Vrancken and Mollinghen. (Emploi de la haveuse a barre "Pick Quick," a commande electrique.) "Annales des Mines, Belgiq." 1912. vol. 17. 3. p. 661-9.

Use of Pneumatic Hammer Drills, and Costs, in Coal Mines in France. Jacquelin. (Note sur l'emploi des marteaux pneumatiques dans l'exploitation dans les mines de houille.) "Soc. d. Ingrs. Civils France, Memoirs." 1912. p. 673-723.

Use of a Portable Compressor Underground. d'Haenens (Emploi dans les travaux souterrains d'un compresseur mobile.) "Annales d. Mines Belgiq." 1912. vol. 17. 3. p. 656. (Used in the Nord de Charleroi Colliery, Belgium, for supplying air to hammer drills in shaft sinking.)

Air Compressor Efficiencies. E. M. Ivens. "Power." vol. 36. 16. p. 579-81. 6 fig.

Hydraulic Compression of Air in Clausthal. O. Falkenberg. (Hydraulisk komprimering av luft i Clausthal.) "Tekn. Ukeblad." 1912. 28. p. 365-7. 6 fig. 60c.

IV—WORKING OF MINERALS

Maltby Main Colliery. A. Thompson. "Min. Eng." vol. 16. 221. p. 198-9. 10c.

Annual Reports of German Trade Unions on Accident Prevention in 1911. (Jahresberichte der gewerblichen Berufsgenossenschaften ueber Unfallverhuetung fuer 1911.) "Deutsch. Reichsversicherungsamts Nachrichten f. 1911." 1912. 2.

V—BORING, SHAFT SINKING AND TUNNELLING

Fireproof Shaft, Vermillion Mine, Westville, Ill. A. F. Allard. "Min. Min." vol. 33. 3. p. 130-2. 10 fig. (Steel sinking shoe and construction of shaft lining and bottom in concrete described.)

The Stockfisch System of Shaft-Sinking at the Diergardt Colliery. "Colliery Guard." vol. 104. 2705. p. 887-8, 7 fig. 15c.

Shaft Sinking by Congelation Process in the Nord Coalfield, Belgium. V. Lechat. (Le bassin houiller du Nord de la Belgique.) "Annales d. Mines Belgiq." 1912. vol. 17. 3. p. 741-52.

Raky Congelation System in Sinking Shafts 9 and 10, St. Vaast Mine, La Louviere & Sars-Longchamps Collieries, Belgium. d'Haenens. (Creusement des puits Nos. 9 et 10, du siege de St. Vaast.) "Annales d. Mines Belgiq." 1912. vol. 17. 3. p. 639-72.

Advantages of Inclined over Vertical Shafts; and the Gmeyner System of Chain Winding. E. Gmeyner. (Ueber tonnlaeigge Foerderschaechte und eine neuartige Schleppschachtfoerderung.) "Montanist Rundschau." 1912. p. 964. (Paper read to Bergmannstag, Vienna, 1912. Abstract.) 30c.

VI—BLASTING, EXPLOSIVES

Dangers in the Use of Explosives, and Precautionary Measures. J. Rudeloff. (Die Gefahren beim Gebrauch von Sprengstoffen und deren Verminderung.) "Zts. f. d. Sprengstoffw." 1912. p. 357.

VII—TIMBERING, PACKING, ETC.

Old Wire Rope Reinforcement for Crown Timbers in Roadways. "Iron Coal Tr. Rev." vol. 85. 2329. p. 633. 30c.

Mine Timber and the Trade in Mine Timber. Eulefeld. (Das Grubenholz u.d. Grubenholzandel.) "Mitt. D. Forstver." 1912. 2; 3 p. 26-75.

Prolonging the Life of Mine Timbers by Impregnation. A. Rzehulka. (Die Impraegnierung der Grubenhoelzer zum Zwecke der Verlaengerung ihrer Standdauer.) "Kohleninteressent." 1912. p. 215. 50c.

Concrete Timbering of Mine Shafts. E. R. Jones. "Coal Age." vol. 2. 17. p. 574-6. 3 fig.

Preservation Treatment of Wood with Zinc Chloride-Sodium Fluoride and Bellite. B. Malenkovicz. (Zur Holzimpreagnierung mit Chlorzink-Fluornatrium und Bellit.) "Elektrotechnik & Masch. Bau." 1912. p. 765-70.

Tests on Some Species of Nova Scotia Mine Timber. F. H. Sefton and C. E. Hodge. "Canad. Min. Jl." vol. 33. 19. p. 669-71. 2 diagr. 40c.

Hydraulic Packing at Bruay Colliery No. 3, N. France. C. M. Doise. (Le remblayage hydraulique au siege No. 3 des mines de Bruay.) "Bull. Soc. de l'Ind. Min. St. Etienne." 1912. p. 65-109.

Piping and Its Selection in Hydraulic Packing. H. Keckstein. (Die Rohrleitungen im Spuehlversatzbetriebe.) "Montan. Rundschau." 1912. p. 955. 30c

Studies on the Theoretic Requirements for the Movement of Sand in Pipes in Stowing. A. Rosenberger. (Bedingungen fuer die Bewegung des Schlaemmversatzes in den Rohrleitungen.) "Zent. Verb. Bergbau. Betrbsl. Oestr." 1912. p. 574. 40c.

VIII—WINDING AND HAULAGE

New Chain, Cableway, and Shunt Rail Haulage Systems of the Skoda Works, Pilsen, Bohemia. E. Blau. (Neuere Ketten-Seil-, und Rangierfoerderungen.) "Zts. Zentr. Bergh. Betrbsl. Oest." 1912. p. 591-603. 40c.

Some Safety Equipments in Haulage over Inclined Planes. G. Ryba. (Einige Sicherheitsvorrichtungen bei der Foerderung auf geneigten Bahnstrassen.) "Zts. Zentr. Bergh. Betrbsl. Oest." 1912. p. 584. 40c.

Wire Ropes for Lifting Appliances and Conditions Affecting Durability. D. Adamson. "Page's Wkly." vol. 21. 422. p. 594-8. 12 fig. 5 tab.

The Factor of Safety in Man Haulage at Great Depths. T. Tregaskis. "S. Afric. Inst. Eng." vol. 10. 11. p. 323-7; 11. 2. p. 43-5.

Determining the Weight of the Tailrope in Koepe-hoisting. E. Oppenheimer. (Zur Frage des Unterseilgewichtes bei Koepefoerderung.) "Kali." 1912. p. 448. 30c.

Hauling Machines Driven by Three-phase Commutator Motors. Janzen. (Foerdermaschinen mit Antrieb durch Drehstrom-Kommutatoren.) "El. Kraftbetrieb." 1912. 22. p. 469-76. 11 fig.; 23. p. 481-9. 8 fig. 6 ill. (The growing importance of the phase series motors for driving hauling machines. Their design, the transformers necessary for their working, the speed-regulation and the working properties are discussed, as well as the special requirements to be fulfilled for driving hauling machines.)

An Electric Hoist with Automatic Control. F. C. Perkins. "Min. Sci. Press." vol. 105. 16. p. 490-1. 1 fig. (The lift and auxiliary machinery at three hoisting shafts and electrical equipment at two shafts at Auchincruive.)

Cost of Operating an Electric Hoist for a Mine Shaft. "Eng. Cont." vol. 38. 14. p. 375-6. 2 tab. (The generator is a 450-kw., 525-volt machine with commutation poles; the hoist weighs 51 tons, the skips carry 2½ tons of ore from the 600, 900 and 1200 ft. levels.)

Electric Hoists in Headgears. S. E. Boult. "S. Africa. Inst. Eng." vol. 11. 2. p. 45-8. 2 fig.

The Electric Motor vs. Compressed Air Drive of Mine Hoists. H. Herberts. (Der Elektromotor im Vergleich zur Pressluftmaschine zum Antrieb von Schacht-Foerdermachinen.) "Foerdertechnik." 1912. p. 192. (Critical review of Pauly's paper read before Am. Inst. Min. Engin.) 60c.

The Ward-Leonard Control in Electric Mine Hoists. (Das Leonard Kontrollsystem fuer elektrische Foerderanlagen.) "Kali, Erz & Kohle." 1912. p. 960. 30c.

The Coal Culm Cableway at the Providence Mine, Marchienneau-Pont, Belgium. IA. Parma. (Die Haldenseilbahn des Werkes Providence bei Marchienne au Pont.) "Kohleninteressent." 1912. p. 217. 50c.

Gathering by Electric Mine Locomotives. G. W. Hamilton. "El. Jl." vol. 9. 9. p. 756-61. (A number of points are detailed which it is essential should receive careful investigation.)

Electric Mine Locomotives. Ohl, W. (Elektrische Grubenlokomotiven.) "Der Elektrotechniker." 1912. 15. p. 193-6. 8 ill. (Description of several types, arrangement of two driver's seats in the centre of the locomotive. Favorable results with accumulator locomotives.)

German Electric Mine Locomotives. A. Gradenwitz. "Eng. Min. Jl." vol. 94. 14. p. 647-8. 4 fig. (The general practice is the generation of three-phase current at the surface converting it to 250 volts or 500 volts underground. Special locomotive for exceptional conditions.)

Accumulator Locomotive without Driver. "El. Z." 1912. 34. p. 877. (Full description of the locomotives which have been in use for 1½ years at the Royal Coal Mine, "Von der Heydt." Description of the details and of the working of these locomotives.)

Signalling Switch Installation for Mine Electric Railways with the Conductor below Ground. M. Henke. (Signal und Schaltanlage fuer elektrische Grubenbahnen mit Fahrdraht unter Tage.) "El. Z." 1912. 34. p. 870-1. 1 fig. (Adjacent to the conductor an insulated signalling wire is laid, carrying a maintaining current which, by means of an electro-magnet at the power station, closes a switch in the conductor circuit. In case of immediate danger current can be cut off from the conductor by breaking the signalling wire.)

Compressed Air Haulage at the Levant du Flenu Collieries, Belgium, Guerin. (Locomotives a air comprime.) "Annales d. Mines. Belgiq." 1912. vol. 17. 3. p. 631-7.

Newer Types of Compressed Air Locomotives for Mines. Th. Giller. (Neuere Druckluftlokomotiven fuer Grubenbahnen.) "Montan. Rdschau." 1912. p. 962. 30c.

Gasoline Motors in Mines. A. F. King. "Gas Engine." Vol. 14. 10. p. 521-4. (History of their introduction first as stationary and now as automobile.)

Economy in Tipple Construction. R. F. Powers. "Coal Age." vol. 2. 17. p. 563-4. 1 fig.

Equipping a Ventilating Shaft for Hoisting Men and Coal, Bois Communal a Fleurus Colliery, Belgium. Gillet. (Amenagement d'une tour d' extraction sur le puits d'aerage.) "Annales d. Mines. Belgiq." 1912. vol. 17. 3. p. 671-7.

IX—SIGNALLING

Telephone and Electric Signalling at Fontaine-L'Eveque Colliery, Belgium. d'Haenens. (Signalisation electrique.) "Annales d. Mines, Belgiq." 1912. vol. 17. 3. p. 658.

Wireless Mine Telephones. O. Dobbelstein. (Ueber drahtlose Gruben-Telephonie.) "Mont. Rundschau." 1912. p. 951. (Abstract of paper read to Allgm. Bergmannstag, Vienna, 1912.) 30c.

X—LIGHTING

Hailwood Electric Miners' Lamp. (La Lampara electrica Hailwood.) "Ingenierfa." 1912. p. 307.

Acetylene Mine Lamps in U. S., Germany and Mexico. (La lampe a acetylene dans les mines.) "Jl. du Four Electriq." 1912. p. 400.

Electric Lighting in Mines. "Electricity." vol. 26. 1145. p. 687. 5 fig. 10c.

XI—VENTILATION

New Permitted Safety Lamp for Belgium Collieries. "Coll. Guard." vol. 104. 2705. p. 892. 1 fig. 15c.

Mine Ventilation on the Rand. W. Heym. (Die Grubenventilation in dem Witwatersranddistrikt.) "Kali, Erz & Kohlen," 1912. p. 915. 30c.

Underground Temperatures and Working Conditions. "Compr. Air Mag." vol. 17. 10. p. 6595-6. 2 tab. (Especially relating to the extra ventilation to carry off the heat of rock face of workings.)

Moistening Mine Ventilating Currents. A. A. Steel. "Min. Min." vol. 33. 3. p. 141-3. 1 fig. 3 tab. (Method of avoiding fog and undue dampness in the use of steam jets and water sprays.)

Notes on Electrically-driven Fans for Mining Ventilation. J. W. Rogers. "Eng. Rev." vol. 26. 4. p. 137-8.

XII—MINE GASES TESTING

Ignition of Coal Gas and Methane by Momentary Electric Arcs. Thornton, W. M. "Jl. Gas Light." vol. 120. 2580. p. 295-6. 1 fig. 3 diagr. (Direct current ignition appears to depend on the material of the poles, and ignition by alternating currents on the nature of the gas.) 30c.

The Ignition of Coal Gas and Methane by Momentary Electric arcs. W. M. Thornton. "Iron Coal Tr. Rev." vol. 85. 2329. p. 623-6. 19 fig.; 2330. p. 676-7. 10 tab. 60c.

XIII—COAL DUST

Conditions Favoring Dust Explosions. J. Verner. "Coal Age." vol. 2. 15. p. 488-90. (Draft prior to the explosion is of consequence and is more in evidence near the floor during the winter; there is apparently a draft towards the explosion even at the height of its force.)

The Relative Inflammability of Coal Dusts. H. Cunynghame. "Coll. Guard." vol. 104. 2702. p. 733-5. 6 fig. 2 tab. 15c.

XIV—EXPLOSIONS

Statistics of Fatal Accidents in Mining in Prussia in 1911. (Verungluecknngen mit toetlichem Ausgange beim Bergwerksbetriebe Preussens 1911.) "Zts. f. Berg.-, H.- & Salinenw." 1912. vol. 60. Statistical No. 1. p. 48-62.

Throwing The Searchlight On Advertising

Little Talks on a Big Subject for Coal Age Readers

By the Ad. Editor

Every so often we hear of a man who we say "is wrapt up in himself." By that we mean that his outlook on life is stilted—that he cannot see beyond his own little sphere.

Contrariwise, there are others who are so centered on occurrences far away that they neglect opportunities close by.

We all know the type of man who, looking toward an ideal, makes every effort bend toward it to the exclusion of many a chance for progress right beside him.

Dickens tells of a conception of his, Mrs. Jellaby, who was afflicted with what he termed "Telescopic Christianity."

This Mrs. Jellaby spent her life in clothing and feeding certain heathen children in foreign lands, while she entirely overlooked the fact that her own children were ill-fed and not clothed properly.

The character is not overdrawn, we have all seen it in everyday life.

"On the fence" is occasionally a good place to be. Our regard for our work is one excellent instance.

Let us not go to either extreme but, instead, keep our eyes open for what is going on close to us *and* in the distance.

Let us recognize the fact that there are other men in the world who know just as much as we do, and that their knowledge is for sale.

Let us keep in touch with what these men are doing. Let us *study*—lectures, books, technical periodicals, all are good—but for us who want *first news* of the latest appliances, *quickly—advertisements.*

There we will find a condensed treatise on ways and means for doing our work *better*—for doing it for *less* money—we'll find news of factors in the thing that makes us all better workmen—scientific management.

And what we read in the selling section we can depend on for—

It pays to advertise only because it pays to buy advertised goods